

COMPUTERWORLD

IBM ups parallel pace

By Johanna Ambrosio
and Rosemary Cafasso
ARMONK, N.Y.

■ IBM is readying its first parallel processing machine for the commercial world: a database engine that, an IBM spokeswoman confirmed last week, will be announced in the second quarter. The first customer shipments should begin very late this year, she added.

IBM is taking the wraps off the computer about a year earlier than planned, analysts said, in order to invigorate its moribund mainframe business with a high-end alternative that is much cheaper than what it now has available.

Initial price points are expected to be about \$15,000 per million instructions per second, compared with a list price of about \$100,000 per MIPS (discounted to \$55,000 per MIPS) for a traditional mainframe.

Still little need

The low price notwithstanding, some users said they see no immediate need for such a machine.

Where a mainframe uses a single, very powerful processor to crunch through a problem as quickly as possible, a parallel machine splits up an application's logic among several processors that work on different pieces of the problem at the same time. Not ev-

More the merrier

IBM's parallel processing plan includes the following:

Phase	Time frame	Number of CPUs
Clusters	1991	4-100
Entry level	1993	8-64
Highly parallel	1995-1996	Up to 500
Massively parallel	1997-2000	Unknown

Source: International Data Corp.

ery business application, however, can use parallel processing because some require data from one process to be available before another process can begin.

IBM's initial foray into the parallel market will be a machine based on a version of a System/390 on a chip. The computer will initially be a database machine designed to handle DB2 inquiries, and as such will compete with the database machine from the Tera-data division of NCR Corp.

The IBM version will still require a host processor for tasks such as

IBM, page 6

Outsourcing

Reinventing Big Blue

By Mark Halper
TARRYTOWN, N.Y.

With its famous blue hue darkening into a somber tone, IBM is turning to its outsourcing subsidiary, Integrated Systems Solutions Corp., in search of a brighter financial picture. The shrinking giant last week demonstrated that its hopes for the future lie in services by making ISSC the main IBM point of contact for IS shops. The moves included:

- Elevating ISSC President Dennis Welsh to the newly created position of chairman and chief executive, giving the operation more credence as a subsidiary.
- Naming a top executive from IBM's Asia Pacific operations as ISSC president. Industry observers said the appointment of Sam Palmisano indicates a strengthening of ISSC's international role.
- Expanding the scope of ISSC's vertical market reach from 11 to 16

ISSC, page 16

A walk through

NetWare 4.0's directory features:

- Common rights and configuration "template."
- Users "inherit" rights.
- Users reside in logical groups.

Users laud directory of beta NetWare 4.0

By Michele Dostert
BOSTON

Networld '93 demonstrations of Novell, Inc.'s upcoming enterprise-oriented NetWare 4.0 drew kudos from users for its directory services and Windows-based man-

agement tools. But it also elicited concerns that implementing the new services will require a commitment to retraining local-area network personnel and rethinking network design.

"The NetWare 4.0 directory services, because they force users into logical rather than server-based groups, will force network managers to sit down and really think about who belongs where and who needs what services," said Edward Cocks, a technical analyst at CoBank

in Englewood, Colo.

He predicted the up-front investment in training and planning required by NetWare 4.0, which is expected in March, will yield large dividends in simplified NetWare LAN management.

Novell is targeting NetWare 4.0 squarely at Fortune 1,000 users and has added a host of features designed to reassure corporate information systems managers who are skittish about trusting their computing future to PC LANs. These features include support for up to

1,000 users, data compression to save memory, packet-burst mode to speed data transmission and protected application space to shield the network from application crashes.

It is the directory services, which are based on the directory structure laid out in the CCITT X.500 specification, that are attractive to users. Rather than reentering user information at each server, network managers can lump users into logical groups, whose members can share the

For additional coverage of Networld '93, see pages 4, 12, 14 and 15.

NetWare 4.0, page 12

Cisco to finally reveal plan for faster router

Added features will bring platform in line with corporate requirements

By Joanic M. Wexler
MENLO PARK, CALIF.

Internetworking giant Cisco Systems, Inc. this week will finally reveal its blueprint for a revved-up router that embraces corporate demands for faster, more reliable data highways that can be trusted to carry core business applications.

Amid a flurry of related announcements that will include a broadened Asynchronous Transfer Mode strategy, the vendor will roll out its Cisco 7000 platform, according to sources close to the company.

The new router will beef up performance, offer redundant power supplies and allow users to replace components while the device continues to run. Industry sources indicated that the Cisco 7000 will ship in 60 days.

Clarifying the long-awaited Cisco direction should help Cisco shops plot their network courses and even out some of the disparities between Cisco's 6-year-old

Cisco, page 14

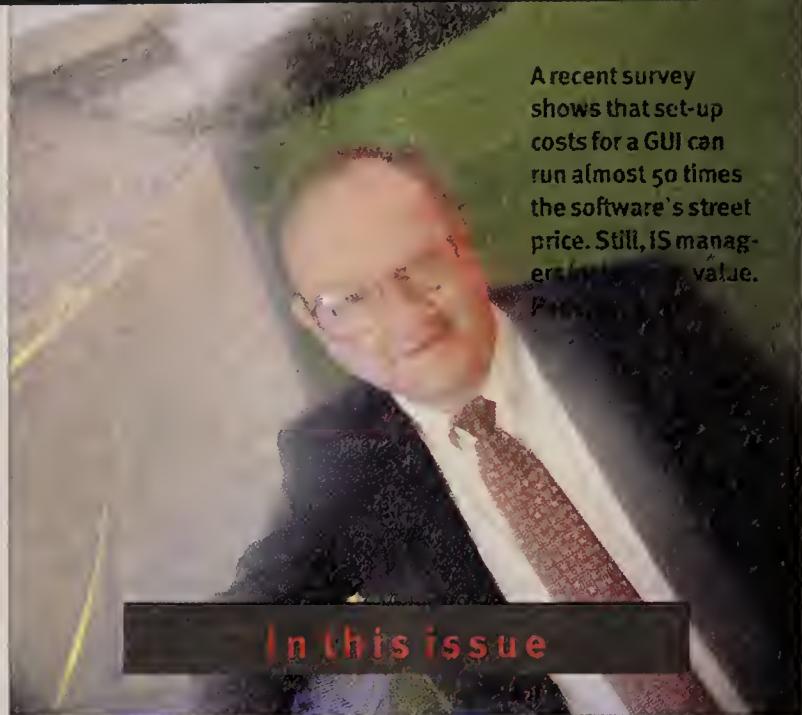
Ripping router

The Cisco 7000 improves on Cisco's current high-end AGS+ in the following ways:

Performance over the router's 533Mbit/sec. CBus backplane will jump from about 65,000 to 100,000 packet/sec.

The seven-slot box will have space for an additional LAN interface module, which could accommodate as many as 28 more networks.

LANs will reportedly not contend for bandwidth over the CBus, guaranteeing native LAN speed throughput.



A recent survey shows that set-up costs for a GUI can run almost 50 times the software's street price. Still, IS managers value...

In this issue

NEWS

IBM continues its efforts to remodel the company into a more profitable venture. A revamp of its Integrated Systems Solutions Corp. outsourcing subsidiary elevates both the unit's stature within the company and the importance of its success to IBM. The vendor is also gearing up for next month's announcement of its first commercial parallel processing machine. *Pages 1 and 16*

Networld '93: Attendees mostly gave a thumbs-up to NetWare 4.0's directory services and collected updates on competing options and standards activity in the E-mail, ATM and LAN analysis arenas. Meanwhile, Cisco this week will finally detail how it plans to transition its 6-year-old router architecture to accommodate proliferating internetworks. *Pages 1, 12-15*



DEC was a three-time winner last week, announcing a smaller loss than expected, the appointment of former Zenith Data Systems President Enrico Pesatori to head up its newly independent PC unit and plans to reposition Pathworks as the glue for multiple network operating systems. *Pages 7 and 14*

IS directors trying to regain some control over PC desktops are standardizing by buying suites of PC application software. They'll have a shot at cutting costs as both Borland and Lotus prepare aggressive pricing plans for forthcoming Windows applications. *Pages 4 and 37*

COMMENTARY

Columnist Esther Dyson says we will have to get used to the idea of computer fallibility if we hope to use technology for intuitive tasks. *Page 33*

IN DEPTH

You can avoid making mistakes implementing client/server applications by picking the right server for the job, installing client PCs with enough power, creating an appropriately sized defined database and overhauling IS skills. *Page 73*

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News

Airline hacking case reveals CRS' security shortcomings

By Elizabeth Heichler

LONDON

Last week's settlement of a case in which Virgin Atlantic Airways accused British Airways of hacking its computer files to steal passenger lists underscores the vulnerability of supposedly confidential flight information.

Airline analysts said the reservation systems of most major carriers are very open — and hence more vulnerable — because they are designed to share information in order to facilitate passenger travel. "All the airlines have access to each others' reservation system," said Tamir Rankow, chairman of the national automation committee of the American Society of Travel Agents in Washington, D.C. But, he cautioned, "that doesn't give them free access to the passenger name record. But I suppose a person just has to be at the right place at the right time to get anything they want."

Rankow added that the competitive battles now bloodying the airline industry could encourage the use of such espionage. "As they stumble over each other trying to get each other's first-class and business traffic, I suspect anything is possible," he said.

In the London lawsuit, the charges came as part of a bitter libel feud in which British Airways admitted making improper attempts to undermine its rival and agreed to pay Virgin Chairman Richard Branson and his company approximately \$935,000 (610,000 pounds) in damages and an estimated

Ounce of precaution

Some suggestions for protecting data:

- Keep wiring boxes and junction closets locked up.
- Invest in an electrical characteristic change detection device, which can detect line tapping.
- Make sure all data is encrypted.
- Compress data, making it more difficult to read — and steal.
- Establish a security policy that defines sensitive data that should not be transmitted.

discovered."

Heichler is IDG News Service's London correspondent. Computerworld West Coast senior correspondent James Daly contributed to this report.

more than \$3 million in court costs. Had the libel case gone to trial, former British Airways employee Sadig Khalifa was prepared to testify to the illegal use of Virgin's computer information, according to Virgin's counsel, Colin Howes of the London law firm Harbottle & Lewis.

According to Khalifa, he and other British Airways staff were shown how to tap into a segment of the British Airways Booking System computer that Virgin rented. Eventually, British Airways was allegedly able to obtain home telephone numbers of first-class passengers and other information on bookings and departure times. According to Virgin's lawyers, passengers were then called by British Airways staff who tried to get them to change their tickets to British Airways flights.

Security consultants said the type of corporate espionage British Airways was allegedly involved in is typical and quite simple. "This is a very, very easy procedure, requiring only a trip to Radio Shack to buy a couple hundred dollars worth of electronics," said Charles Cresson Wood, an independent security consultant in Sausalito, Calif.

Wood added that such wiretap cases do not frequently come up in the news because "a lot of people don't know they're being wiretapped. These taps can go on for years before — or if — they are ever

Sequent to offer Windows NT line

By Mark Halper

BEAVERTON, ORE.

Sequent Computer Systems, Inc., a longtime Unix devotee, this week will reveal plans to offer a line of machines for enterprise-wide computing that run Microsoft Corp.'s forthcoming Windows NT operating system.

Sequent will offer a top-to-bottom line of NT servers called the WinServer series, with PC server specialist Triord Systems, Inc. supplying the machines for the lower end of the series.

Sequent Chief Executive Officer Casey Powell said his company remains committed to Unix but he sees room for two open operating systems on the enterprise. "To be an open systems provider, it will be necessary to offer both Unix and NT," Powell observed.

The Sequent executive said the company will formally announce the line shortly after Microsoft introduces NT, which is slated for May.

Users are interested in NT systems as downsizing platforms. Information systems officials at Taco Bell Corp. in Irvine, Calif., and at Houston-based Lyondell Petrochemical Co., a \$5.7 billion chemicals processor, said NT could be a

more comfortable choice than Unix. That is because the Microsoft operating system would almost certainly run more seamlessly with the many Microsoft programs they now operate.

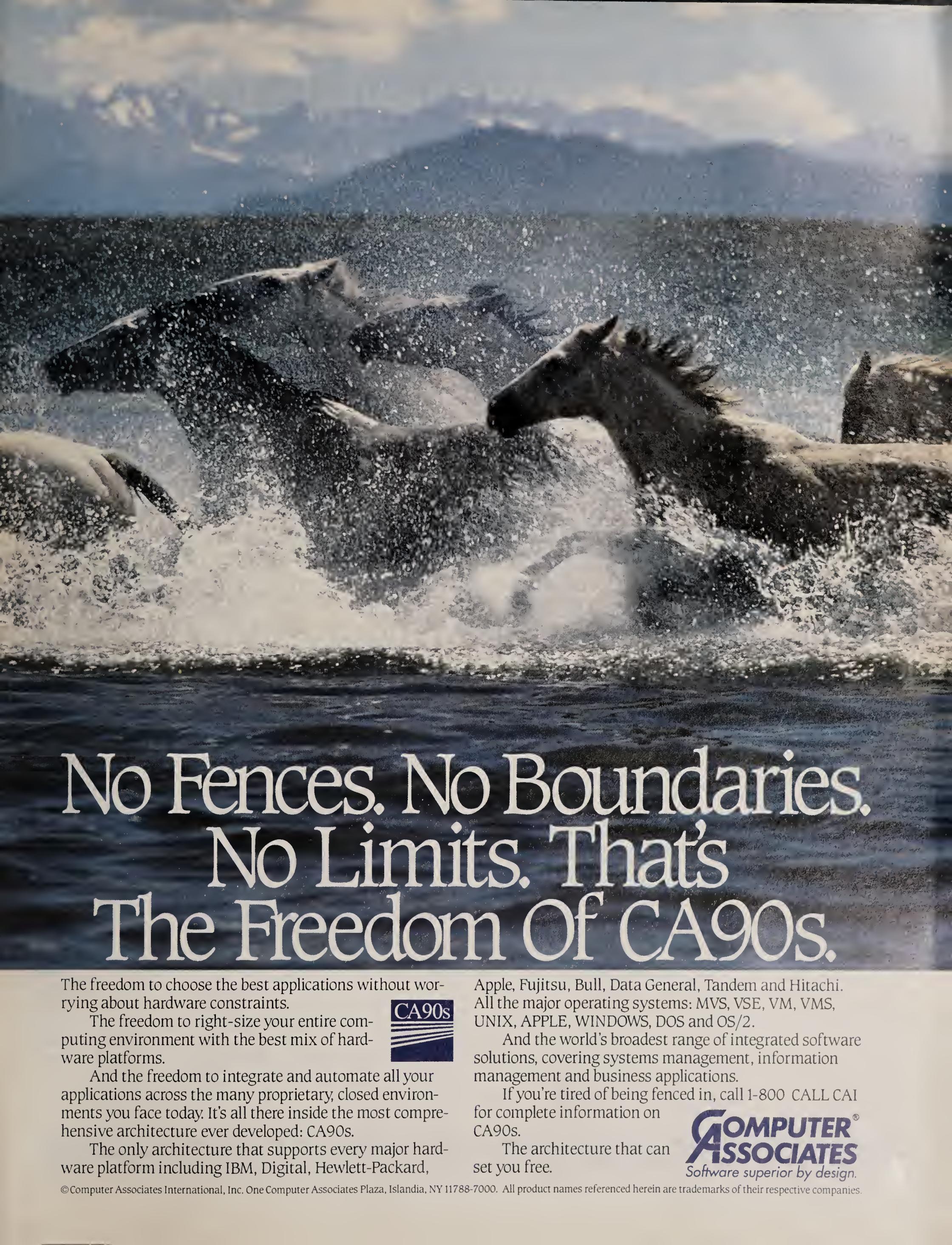
"We are concerned that when you put a box out there that everyone needs to talk to, how well does it integrate into our environment?" said Rick Smith, manager of systems development at Taco Bell.

Weighing options

Smith said Taco Bell expects to receive a Sequent beta-test system sometime next month. It is also considering an NT platform from Compaq Computer Corp. Smith said he is weighing the scalability of the Sequent system against the price/performance of the Compaq box.

Tom Kilbourne, information services evaluation manager at Lyondell, said he is confident Microsoft will deliver a robust operating system that would at least make it easy for users to add functionality if it is not already built in.

The high-end WinServer hardware will incorporate the same design Sequent uses for its Symmetry Unix line, which currently scales up to 16 Intel Corp.-type processors.



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Notes gets open, modular structure

By Michael Vizard
BOSTON

Hoping to convince information systems directors that Notes is a viable platform for building a peer-to-peer communications infrastructure across their organizations, Lotus Development Corp. last week outlined an open, modular architecture for its groupware offering at Networld '93.

Dubbed the Lotus Communication Architecture (LCA), this new strategy could help Lotus combat assertions by rivals Microsoft Corp. and Borland International, Inc. that Notes is a closed architecture and handle requests from users who want to more easily integrate other vendors' packages into the Notes environment.

For Lotus, the outlining of LCA is the beginning of a drive to bring Notes into a variety of environments. "Lotus is trying to position Notes as a corporate solution. As they try to position themselves alongside IBM and DEC, you're going to see more architecture announcements," said John Donovan, director of groupware services at WorkGroup Technologies, Inc. in Hampton, N.H.

"If Notes is going to be broadly accepted, it absolutely needs people other than Lotus developing applications for it," he added. Internal sources said Feb. 24 is the launch date for Notes Version 3.0.

LCA also helps deflect criticism that Notes is a closed architecture. "There's a tremendous competitive focus on Microsoft at Lotus. They're running the risk of being too focused on anything Microsoft says; they're like a deer in headlights," Donovan said.

Modular separation

Under LCA, Notes is separated into modules that consist of an interface to electronic-mail messaging services, application programming interfaces (API) for linking third-party applications to the object database in Notes and support for Open Database Connectivity (ODBC), which is Microsoft's implementation of the SQL Access Group standard.

An interface to E-mail messaging services will allow users to choose between Lotus' CC:Mail or the native mail transports within Notes, said Cliff Conneighton, director of marketing for communication products at Lotus.

The first products to comply with LCA guidelines are Version 4.0 of CC:Mail Router, which sends mail over wide-area networks, and the Lotus High Fidelity Mail Exchange, which sends mail messages between CC:Mail and Notes users. CC:Mail Router 4.0 ships this month. Lotus may also use the interface to support other E-mail systems, Conneighton said.

Also part of LCA is an API called the Document Management Interface (DMI), which Lotus expects will promote development of applications that are integrated with the object database in Notes. Developers can also use Microsoft's Object Linking and Embedding facility instead of DMI to link applications to Notes.

And in the same vein, Lotus has opted to support ODBC under its DataLens offering to give Notes applications access to data stored in a SQL format.

Borland promo hits back

By Christopher Lindquist
SCOTTSVALLEY, CALIF.

The software pricing balloon deflated a little more last week as Borland International, Inc. lowered the cost threshold even more with its announcement of new pricing promotions for key products.

For example, users will be able to purchase the soon-to-be released Paradox for Windows for \$139.95 and Quattro Pro for Windows for \$99.95. This compares with current pricing of \$795 and \$495, respectively.

The discounted pricing may appear to some as a response to Microsoft Corp.'s recent release of its Access database for \$99. Last month, after announcing plans to lay off 15% of his work force, Borland founder Philippe Kahn accused Microsoft and Lotus Development Corp. of being behind an ongoing software price war that he blamed in part for his company's woes [CW, Dec. 14, 1992].

However, both Borland and analysts indicated the promotion is more complex than simply lobbing another volley in the software price war.

"Going to this \$139 [promotion] allows them to do a jump-start [for Paradox]," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. He indicated that while Access is selling well, it appears to be moving into low-end, user markets instead of the high-end business market dominated by Paradox and dBase.

As a result, Bajarin said, Borland may be acting to prime the Paradox for Windows pump rather than responding to Access. "I don't think it's a desperation thing," he said.

Indeed, Borland claims the move is more of an attempt to

guarantee sales than to compete with Microsoft. "We have seen companies that have come into the Windows market assuming that because they were successful under DOS they would be successful under Windows. And they got a rude awakening," said David Watkins, vice president of product marketing at Borland.

He pointed to Lotus' 1-2-3 for Windows and Software Publishing Corp.'s Harvard Graphics for Windows as examples of dominant DOS products that stumbled in the Windows arena.

However, pricing pressure is certainly part of the equation that went into the promotion, Watkins added. As with hardware pricing, users now expect more product for less money, he noted, and Borland is ready to offer that.

The users making those demands include corporate customers. Bajarin said Borland may have been feeling pressure from large corporations using Access as a lever to get better Paradox pricing. "I suspect that part of the problem is that IS guys may be beating up on them by saying 'Hey, I can go buy Access,'" he said.

Dan Atkins, manager of line operations planning and analysis at Northwest Airlines in Minneapolis, said such levers are appealing to customers who expect lower prices in today's software market. "We've become accustomed to expecting attractive pricing like this," he said, adding that the software market is similar to the airline arena in that users expect cut rates or they will not buy.

The pricing promotion for Quattro Pro for Windows starts immediately. The Paradox for Windows promotion will begin upon shipment of the product, which is slated for Feb. 1. Both promotions are scheduled to last 90 days.



Lotus ups Windows ante

Improv spreadsheet to cost same as 1-2-3

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. intends next month to kick off an aggressive campaign to increase share in the Windows spreadsheet market after delivering its multidimensional, next-generation Improv spreadsheet, which will be offered at the same \$495 price as its 1-2-3 for Windows offerings.

Lotus Senior Vice President Robert Weiler said the company also plans to launch Improv with a discounted introductory offer, which he declined to specify.

And while it remains unclear even within Lotus as to what the ultimate relationship will be between Improv and 1-2-3, the company's decision to price a more advanced Improv spreadsheet on the same level as 1-2-3 is likely to entice large numbers of users away from 1-2-3 in favor of the superior analytical capabilities of Improv, Weiler said.

Despite such optimism, Improv for Windows faces an uphill climb just to achieve the same market share that 1-2-3 for Windows currently holds. Currently, Lotus claims to have roughly a 30% share

of the Windows spreadsheet market, compared with its 90% share of the DOS market.

Unlike its sales effort behind 1-2-3, Lotus will not be able to count on much of an installed base to push Improv. The only platform Improv is currently available on is Next, Inc.'s NextStation.

'Three evils'

But Improv has already caught the eye of some. "Improv takes care of what I call the three evils of spreadsheets when it comes to analytical modeling," said Sam Savage, a consulting associate professor in the department of operations research at Stanford University, which is beta testing Improv.

The first evil, Savage said, is that traditional spreadsheets are not sealable in that users cannot add data and rows. The second evil: Users cannot add another dimension to an existing model; and the third evil is that there is no way to audit the spreadsheets.

"Accounting firms must all have ulcers every time a spreadsheet goes out because they can never audit the logic that was used to build a particular spreadsheet. I

think these types of firms will be among the first to adopt Improv," he added.



Critical point

Managing the potential enthusiasm for Improv could prove to be troublesome for Lotus because the next major upgrade of 1-2-3 is not due until the second quarter, while Improv is scheduled to begin arriving on user desktops next month.

"Lotus' challenge is not to confuse the market with Improv," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

According to Weiler, the decision to price Improv on a par with 1-2-3 was driven by competition from Microsoft Corp.'s Excel spreadsheet for Windows, which currently dominates the Windows spreadsheet market.

Meanwhile, Version 2.0 of 1-2-3 for Windows is expected to enter beta testing shortly. It will be a 32-bit implementation and will include support for version control over spreadsheets shared among multiple users, in-cell editing and the ability to use 256 colors to create charts, said Nina Primm McIntyre, Lotus director of spreadsheet product management.

Improv
allows users
to
dynamically
manipulate
data on the
fly. Users can
analyze up to
12 columns
of data in the
same
spreadsheet.
Formulas
used in the
Improv
model are
displayed in
English
logic, which
allows users
to see the
logic behind
cell values.

PERFORMANCE COMPARISON

SYBASE BEST: 183 TPS

ORACLE7 BEST: 645 TPS

Database Computer Cost/TPS

Transactions Per Second

ORACLE7 Pyramid MIServer ES	\$ 10,765	645.1
ORACLE7 Sequent S2000/750	\$ 11,066	618.3
ORACLE7 HP 9000/890	\$ 11,606	578.0
ORACLE7 VAX 7000/640	\$ 8,946	508.4
ORACLE7 NCR 3550	\$ 9,398	312.3
DMS Unisys A16-61E	\$ 43,190	272.5
DMS Unisys 2200/622ES	\$ 43,980	255.7
ORACLE7 DG AViiON 6280	\$ 7,858	239.1
TIP/FCSS Unisys 2200/462	\$ 28,053	228.5
Rdb VAX 6400	\$ 9,172	208.8
ORACLE7 HP 9000/897	\$ 10,737	184.5
SYBASE Sequent S2000/250	\$ 8,686	183.3
TIP/FCSS Unisys 2200/442	\$ 27,623	177.3
Informix HP 9000/870	\$ 15,868	173.2
SYBASE Sequent S2000/700	\$ 14,662	168.9
ORACLE7 IBM RISC 6000/980	\$ 11,002	160.3
DMS Unisys 2200/611ES	\$ 43,529	159.4
DMS Unisys A16-41E	\$ 44,220	158.1
ORACLE7 IBM RISC 6000/580	\$ 9,179	157.2
ORACLE7 NCR 3450	\$ 8,045	152.4
Informix NCR 3550	\$ 12,737	150.6
ALLBASE HP 3000/992	\$ 12,963	145.0
DMS Unisys 2200/462	\$ 37,726	133.1
Informix Sequent S2000/700	\$ 22,196	129.1
Informix Unisys U6000/85	\$ 24,410	129.0
Rdb VAX 7610	\$ 8,938	123.8
Informix IBM RISC 6000/580	\$ 8,034	120.9
Informix HP 9000/870	\$ 17,783	111.1
ALLBASE HP 3000/977	\$ 9,853	111.1
SYBASE HP 9000/867	\$ 8,323	110.5
SYBASE HP 9000/877	\$ 8,472	110.5
Informix HP 9000/867	\$ 9,717	110.4
Informix HP 9000/877	\$ 9,866	110.4
ORACLE7 Sun 690MP	\$ 12,604	107.2
DMS Unisys 2200/442	\$ 37,458	104.5
Rdb VAX 4600	\$ 8,295	103.8
Rdb VAX 4500	\$ 9,910	103.1
Rdb VAX 6610	\$ 9,455	102.3
Informix IBM RISC 6000/970	\$ 10,730	100.9
Informix NCR 3450	\$ 8,422	100.3

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News Shorts

Microsoft sales soar

Microsoft Corp. once again demonstrated its ability to sail smoothly in rough economic waters by posting a 38% increase in revenue for its second fiscal 1993 quarter over the same period in 1992. Microsoft's revenue increased from \$682 million to \$938 million, and income grew from \$175 million to \$236 million.

Sales up, profits slip at Apple

Shortages of key products coupled with a new financial model of higher product sales and lower gross margins took a bite out of the pocketbook of **Apple Computer, Inc.**, as the company brought in more money but less profit compared with the year-earlier quarter. Net revenue for the first quarter of fiscal 1993 was \$2 billion — its first revenue quarter to clear the \$2 billion hurdle — which represented a 7.4% increase from the \$1.86 billion reported in the first quarter of the previous year. Net income was \$161.3 million, a slight slip from 1992's first-quarter net income of \$166 million. Total Macintosh unit growth was up more than 31% from the same quarter in fiscal 1992, but gross margin slipped to 40.5% from the year-earlier level of 43.7%.

Apple names successor to Heinen

Apple was quick to find a replacement for Roger Heinen, the software chief who recently defected to archrival Microsoft. Taking Heinen's old post will be David Nagel, 47, a respected leading scientist at Apple and senior vice president of the firm's advanced technology group. Nagel will report to Chief Executive Officer Michael Spindler in his position as senior vice president of the Macintosh Software Architecture Division.

Inacom buys Sears centers

Sears, Roebuck and Co. last week sold its Sears Business Centers (SBC) division to **InaCom**, an Omaha-based computer and communications systems provider. Financial details of the transaction, which is expected to be completed within 30 days, were not disclosed. The 49 SBC branch offices, with their 750 employees, sell computer and communications gear to large businesses. They are distinct from the 174 departments within Sears stores that sell home office computers. InaCom said some SBC locations would remain stand-alone offices, while others would be merged into InaCom's 1,200 locations nationwide. Sears said SBC offices not included in last week's agreement would be closed.

Feds to purchase 'green' PCs

The U.S. Department of Energy, the Environmental Protection Agency (EPA) and the General Services Administration announced they will purchase energy-efficient PCs when they become available in June. In cooperation with the EPA's "Energy Star" program, vendors are introducing desktop PCs with power management features that shift to "sleep" mode when idle. The EPA alone expects to save \$450,000 in utility costs per year.

SHORT TAKES On Feb. 2, IBM will introduce a new set of RISC System/6000 workstations and servers, including a RISC-based scalable parallel processing system and a data server.... U.S. Sen. Conrad Burns (R-Mont.) said he plans to introduce a bill overturning the U.S. Supreme Court ruling that limits home-office tax deductions because it discourages telecommuting.... **Oracle Corp.** and **Sun Microsystems, Inc.** last week announced a strategic alliance to peddle their wares to the pharmaceutical industry.

News shorts, page 16

Times alter Comdisco

Firm hopes to grow software as mainframe market shrinks

By Johanna Ambrosio
ROSEMONT, ILL.

In a bid to lighten its dependence on the now-shrinking mainframe leasing business, **Comdisco, Inc.** has for the first time begun selling software and is playing up its service offerings in a big way.

While Comdisco's total leasing revenue has grown roughly 14% during the past five years, mainframes as a percentage of that revenue have shrunk from 60% to 30%.

To help make up the difference, the company has introduced a PC-based asset management tool called **Class**. Under development for four years, Class has only recently been sold on the open market, said Comdisco President and Chairman Ken Pontikes.

Another recent initiative is an agreement with **Bull HN Information Systems, Inc.** systems integration affiliate **Integris** to jointly develop software that will help IBM mainframe users migrate to or coexist with Unix systems. Products from this alliance are due early this year.

The software initiatives, Pontikes said, are intended to lead the company's charge into the asset-management market and to help sell consulting services.

"We want to help customers purchase, control and migrate their assets," which can include everything from computers to typewriter ribbons, Pontikes said.

About half the customers that buy Class, which runs under Microsoft Corp.'s Windows and starts at about \$8,000, will also sign up for consulting services, he estimated.

Eventually, Pontikes said, Comdisco hopes to derive about one-third of its revenue from consulting or services, up from about 10% today. The consulting organization has been shored up with more than 100 new hires, even as the company as a whole has cut 200 administrative positions.

Aiming for flexibility

Along with this focus comes a change in how Comdisco approaches business with its customers. "We have to be much more flexible, provide new leasing terms and help customers with just-in-time computing," Pontikes said. "It's not just one-off transactions anymore."

Some customers have noticed the change in philosophy. "I've seen the marketing people becoming more involved with trying to understand my direction in hard-

ware," said John Callahan, manager of systems planning at **Borden, Inc.** in Columbus, Ohio.

"I think the strategy is a sound one," said Shao Wang, an analyst at **Smith Barney, Harris Upham & Co.** in New York. "At this point, it's more of an embellishment rather than a complete change in direction: a nurturing of the customer relationship rather than a hunt-and-kill mentality."

The difference, Wang said, is that in the latter the company would go in, lease a piece of equipment and then come back when the lease was almost up to try to renew it.

Now, he said, the focus is on trying to understand the customer's total needs, so Comdisco can also lease some disk drives or sell disaster recovery services.

Still, Comdisco is not abandoning its traditional leasing or disaster recovery markets. In fact, the company recently purchased the UK leasing assets of **Meridien Computers Ltd.**, as well as some of **McDonnell-Douglas Capital Corp.**'s computer leasing assets.

In addition, the company has expanded its leasing portfolio to include PCs, networking gear, medical devices and point-of-sale terminals.

IBM ups parallel pace

CONTINUED FROM PAGE 1

storage management, industry watchers said.

Probably by 1995, however, this machine will become the basis for a more general-purpose parallel processor. It will be able to link up various computers via IBM's **Sysplex** architecture, which provides a central point of control for multiple MVS-based mainframes, and thus can handle all of an information systems shop's processing load, analysts said.

It will take that long for IBM to develop parallel-type versions of other software that many commercial customers use.

Even then, IBM will not position the parallel machine as a replacement for the traditional **System/390** mainframe, the spokeswoman said. "We will continue to enhance and develop the 390 for as long as our customers ask us to. Any replacement will be many years down the road."

In the meantime, this first parallel computer will be architected to handle up to 100 processors. IBM will include with the machine

more highly parallel versions of its **DB2** database management system, **CICS** transaction processing software and **MVS** operating system, analysts said.

Users, meanwhile, are treading carefully. Joseph Vincent, director of technical services at **Humana, Inc.** in Louisville, Ky., said, "We've looked at the **Teradata** machine for the past seven or eight years and still haven't found a subset of our database processing that makes sense to split out."

Tom Braswell, vice president at **Genuine Parts Co.** in Atlanta, echoed that sentiment. "I don't think we'll have any need for parallel processing for at least four or five years," he said.

Still other users were confused about what transition would be needed to get to parallel process-

ing. "We've got 25 years built on the old transaction systems," said David Barany, chief information officer at **Household International**. "The question is if we have to redo existing code."

Despite what may be a slow-growing market, analysts said IBM's hand was essentially forced. "They could not ignore the price differential between the 390 and

IBM will not position the parallel machine as a replacement for the System/390 mainframe.

the alternative mainframes," including those from **Hewlett-Packard Co.**, **NCR Corp.** and **Unisys Corp.**, said Jim Cassell, an analyst at **Gartner Group, Inc.** in Stamford, Conn. "Eventually, if IBM and the rest of the traditional vendors don't react, no new applications will go onto the traditional mainframes."

Added Frank Gens, an analyst at **Technology Investment Strategies Corp.** in Framingham, Mass.: "The future of large systems is taking relatively low-cost components and building scalable multiprocessor systems."

Pesatori to head DEC PC unit while . . .

By Melinda-Carol Ballou

Digital Equipment Corp. Chief Executive Officer Robert Palmer last week made good on his promise to bring in new blood by persuading Zenith Data Systems President Enrico Pesatori to take on a new post as vice president of DEC's newly independent PC unit.

Pesatori is credited with revamping Zenith Data's PC business, in part by instituting telemarketing and opening up new channels to the company. He is expected to spearhead efforts to wring more revenue out of one of DEC's few bright spots—ironically, its PC business.

"He has a lot of challenges; getting the business clearly structured as an independent unit [is one of them]," said John Rose, former head of DEC's PC operations and now a principal at Robert W. Duggan and Associates, a Santa Barbara, Calif., investment group.

DEC will need Pesatori's experience because its bid to return to the black rests at least in part on increasing the revenue of its PC business.

Although DEC is likely to double its PC market share from 1%, on revenue of about \$500 million, to 2% this fiscal year, the company's late entry into the market is still a hindrance.

For example, persuading non-DEC customers to embrace DEC PCs will be a challenge, as will be efforts to obtain reasonable margins, said Randy Giusto, an

analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Toward that end, DEC is expected to launch two new lines of Extended Industry Standard Architecture and AT bus 486-based servers during the third quarter. They are likely to be priced competitively and will come stacked with fea-

tures, according to internal DEC and industry sources.

The new family of entry-level servers is code-named Tiger III and is expected to be bundled with 120M- or 240M-byte hard drives, S3 local bus video, Personal Computer Memory Card International Association slots, integrated fast Small

Computer Systems Interface support and diagnostics on CD-ROM, the sources said.

"The ability to support multiple systems has been a plus for them, in addition to their success with DECdirect," Giusto said.

The price points for the new systems are likely to range from slightly under \$3,000 to about \$6,000, sources said.

Senior writer Michael Fitzgerald contributed to this story.

... Zenith Data suffers his loss

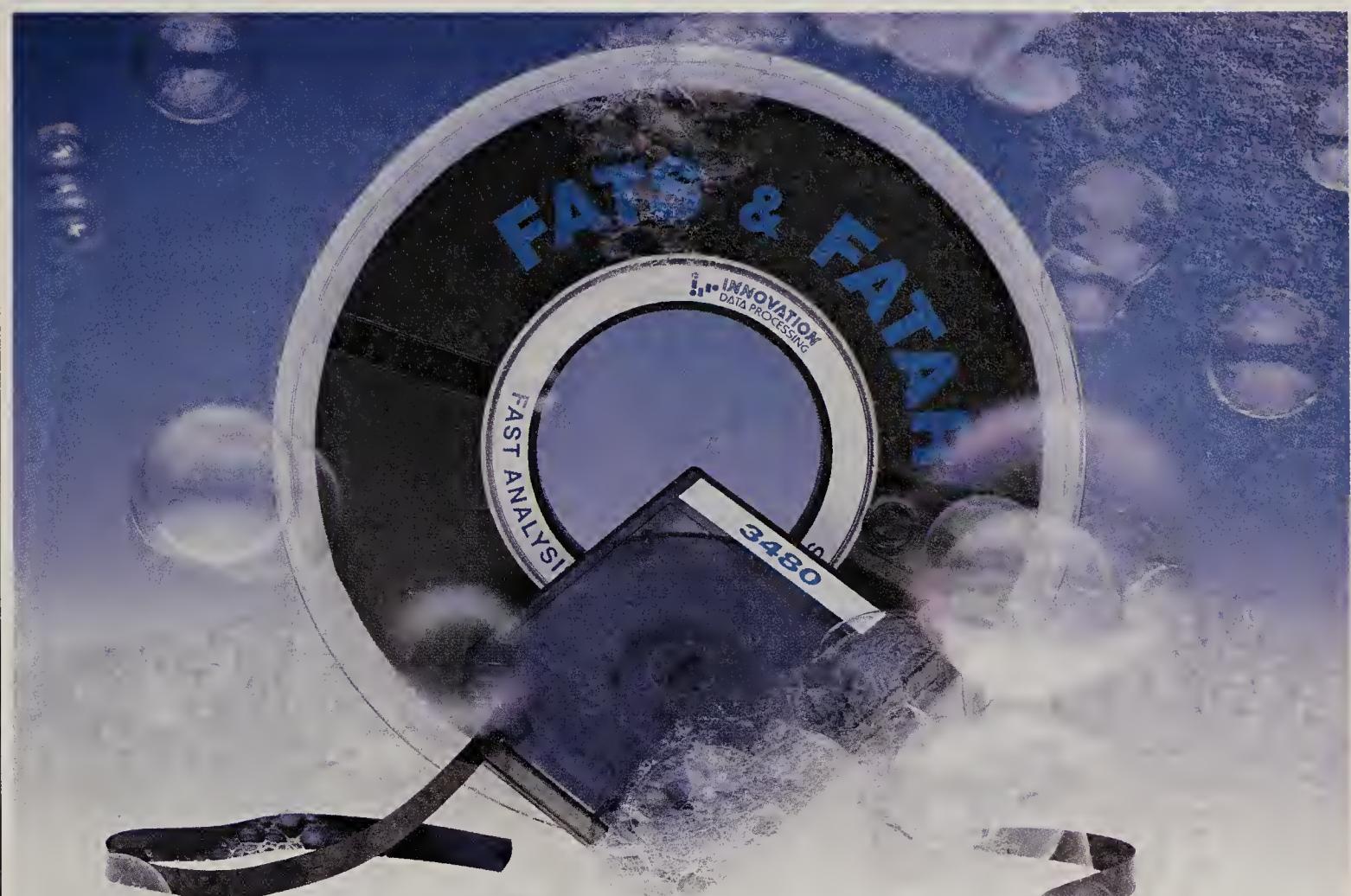
After a two-year stint at the helm, Enrico Pesatori appears to have steered Zenith Data Systems past the numerous rocks that threatened to sink it. But it is unclear whether Zenith Data can gather more wind in its sales.

Pesatori, who arrived in January 1991, reversed a sales and profits free-fall at Zenith Data. The \$1 billion company is expected to break even for 1992, after losing money in 1991.

International Data Corp. analyst Richard Zwetchkenbaum said Pesatori spearheaded the introduction of innovative new products and a channel expansion that helped Zenith Data ship 233,000 PCs in the U.S. last year. That is a 15% uptick from 1991 but far short of the 386,000 PCs it shipped in 1989.

Zenith Data recently suffered the loss of Desktop IV, a \$740.3 million Air Force contract that has twice been awarded and revoked. Still, most analysts said Pesatori's leaving the company should not stem its small surge of momentum because of the management team he assembled.

Zenith Data parent Groupe Bull moved quickly to name Jacques Noels president and chief executive officer. Noels was president of Nokia Consumer Electronics, Inc.—Michael Fitzgerald



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Distributed systems

HP, Tivoli team up on Unix management

By Maryfran Johnson
AUSTIN, TEXAS

Tivoli Systems, Inc. and Hewlett-Packard Co. last week declared themselves partners in the thorny task of simplifying

the management of distributed Unix networks.

Tivoli, which makes object-oriented software for managing distributed computers, will port its Tivoli Management Environment (TME) to the HP 9000 line

of Unix-based workstations and servers. HP will jointly market the TME product suite alongside its own OpenView software for network management.

The pairing of HP and Tivoli is "an attractive combination," said Gordon Kerr,

senior vice president of MIS at Hyatt Hotels Corp. in Chicago, a large user of HP Unix servers. "I like the way HP encourages [other vendors] to plug into a framework, rather than tying Tivoli or some other software directly into the HP/UX operating system," Kerr said. "Users want that layer of insulation so, as many other tools become available, they can be plugged in as well."

Tivoli's software runs only on Sun Microsystems, Inc. machines now, but the company has been emerging as a key player in the distributed systems management game.

Both the Open Software Foundation (OSF) and Unix System Laboratories, Inc. have settled on Tivoli software as a core technology for their own industry-standard offerings in this area.

HP's OpenView technology and Tivoli's underlying framework form the majority of the OSF's Distributed Management Environment (DME), noted David Smith, an analyst at International Data Corp. in Framingham, Mass.

Compatibility concerns

Still unclear, however, is how easily OpenView or Tivoli's software will mesh with DME once it becomes generally available in late 1994 or early 1995. No company has offered specific plans or promises to handle whatever integration efforts lie ahead for customers.

"A lot of users are concerned about whether products such as these will really play together," said Dave Eaton, an official at InterWorks, the HP workstations user group. "Nobody wants to turn down the early efforts from the vendors because something that helps today is money in the bank. But nobody wants to go through a horrendous migration effort once the OSF technologies are deliverable."

Many users are still skeptical about using off-the-shelf system management software. "We have a number of different Unix platforms in-house, and it's really hard to use one management tool on all the platforms," said Hong Huie, a development engineer at Honeywell Commercial Flight Systems/Minneapolis Operation in Minnesota.

In the meantime, the availability of Tivoli software for HP users will fill in some of the gaps in OpenView — particularly in security functions and user account management.

For its high-end customers, HP has another key alliance in systems management with Computer Associates International, Inc. CA is now bundling its CA-Unicenter software with HP 9000 servers. That partnership should not conflict with the Tivoli one, analysts said, because CA's approach is a data center one for companies downsizing to large Unix servers, while Tivoli's focus is on distributed workstation environments.

The current version of TME Release 1.5 will be available on HP 9000 workstations and servers in March but will only manage HP machines. TME 2.0 is scheduled to ship in the third quarter and will manage Sun and HP workstation networks. Pricing for TME Release 1.5 starts at \$37,500 for a 50-node network.

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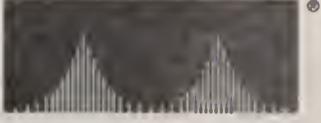
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CA users like 'open' approach

Firm plans to enhance connectivity to multivendor database environments

By Thomas Hoffman
SANDIEGO

■ Attendees at Computer Associates International, Inc.'s Information Management Conference here last week warmly greeted several open systems initiatives, including plans to provide increased interoperability between CA's database environments and further data sharing between IBM mainframes and client/server architectures.

Many users were decidedly upbeat about CA's plans to support Microsoft Corp.'s Open Database Connectivity (ODBC) initiative. Also welcomed were CA's plans to offer its CA-Datacom and CA-IDMS database clients the opportunity to share data between legacy mainframe systems and client/server environments. That capability was bolstered by CA's decision to extend its CA-Visual Objects object-oriented application development environment to database customers via standard SQL calls.

The developments were welcome in part because many user organizations are either currently downsizing or planning to downsize the bulk of their mainframe applications into less expensive and easier-to-use client/server environments.

"We're excited about CA's support for ODBC



because we're looking to improve data sharing between 110 state agencies while protecting our mainframe application investments," said Karl Heekart, data resources manager for the Arizona Department of Administration.

Analysts reached last week said they had not been briefed and therefore could not comment on CA's announcements.

Microsoft's ODBC is a vendor-neutral programming interface for database connectivity among PC, minicomputer and mainframe systems. Windows applications with the ODBC application programming interface calls will be able to directly access CA-IDMS, CA-Datacom and CA-DB databases on multiple platforms through new database drivers that will become available in the second quarter.

Industry pundits said they understand CA's motivation to support Microsoft's ODBC initiative ahead of Integrated Database Application Programming Interface (IDAPI) and IBM's Distributed Relational Database Architecture (DRDA). "The potential of Windows NT is most likely encouraging [CA Windows] users to demand ODBC support from CA," said Tina Foraker-Blackwell, an analyst at New Science Associates, Inc. in Westport, Conn. Besides, "it's become increasingly important for vendors to support different data formats and communications platforms," she added.

Clients with SQL access on their databases

will receive ODBC support at no extra charge, according to Mare Sokol, CA's director of product strategy.

Pledge of support

Sokol said CA will continue to support the IDAPI and DRDA initiatives. CA pledged its support for both last year but has not yet announced delivery timetables for product integration. However, Sokol said CA users are requesting ODBC compliance before IDAPI or DRDA compliance, having demonstrated more interest in Windows-based products than OS/2 2.0 products to date. He said CA will likely offer IDAPI compliance with six IBM OS/2 2.0 products it will begin shipping in March, including CA-Compete.

CA-Visual Objects, CA's next-generation, object-oriented application development environment for Windows, will allow CA-Datacom and CA-IDMS users to access legacy data through a SQL interface.

That decision was warmly greeted by Doug Walker, a senior programming analyst at Brigham Young University in Provo, Utah. The university has been trying to develop a "true graphical user interface environment, but Microsoft's Visual Basic tool kit will only support Windows," Walker said, adding that Brigham Young is interested in CA-Visual Objects because it also supports IBM's OS/2 2.0 operating environment.

More to come

In addition to its database connectivity initiatives, CA also detailed several new application development products and strategies. For example, the company announced plans for CA-Ramis and CA-Easytrieve servers, which were designed to give users access to mainframe development systems through Windows. The products, scheduled to ship in the second quarter, are priced from \$15,000. CA also introduced CA-Realall Workbench, designed to off-load Cobol development and maintenance and to downsize Cobol systems and applications. The Windows-based development facility is slated to go into beta testing in the second quarter and to ship by summer, with pricing at \$2,500 per copy.

Client/server applications

Gupta offers tool kit for enterprise apps

By Jean S. Bozman
MENLO PARK, CALIF.

Gupta Corp. last week tried to broaden the appeal of its 4-year-old SQLWindows database query tool set beyond the departmental managers who are using it to build client/server applications.

In a bid to ignite information systems-level interest, the database maker offered up a software repository and version-control features said to allow teams of programmers to design enterprise-wide applications.

Combined with collaborative programming features, the SQLWindows 4.0 repository is seen as the key to wider use of Gupta products in large IS shops. It was developed by Jarrah Technologies Ltd., a Gupta value-added reseller in Balgowlah, Australia.

"A year ago, we started to focus on downsizing and enterprise-wide development," said Gupta Chief Executive Officer Umang Gupta. Noting Gupta's base of 21,000 li-

verses in corporate departments, he said that "Now, 20 or more programmers can collaborate on a massive project that would formerly have been done on a mainframe system."

Reacting to user complaints that SQLWindows' proprietary SQLWindows Application Language, or SAL, is difficult to learn, Gupta revised its 2-year-old Quest end-user tool and tied it directly to SQLWindows. Now, a pop-up window can be used to pass users' Quest queries to SQLWindows developers for refinement. Quest's link to target database servers allows developers to "page" through database tables during design.

"That's the right response to what Microsoft's Access [database query builder] is doing," said Tony Percy, a senior software analyst at Gartner Group, Inc. in Stamford, Conn.

Beta-test sites reported that SQLWindows 4.0 had several bugs.

"We've tried it, and it's blown up on us," said Rob Lee, a programmer/analyst at Illinois Power in Deatur, Ill., who has had his copy since last month.

Lee noted that several features promised previously were absent in his beta-test copy, including some kinds of object-oriented functionality.

However, Lee said he is looking forward to the production version because it would allow 20 programmers to update his department's Gupta SQLBase database server; now only two programmers have "write" privileges.

Industry analysts said Gupta has to push hard to stay ahead of strong competitors such as PowerSoft Corp., Easel Corp. and Microsoft Corp., each of which sells database development tools that run in a Windows environment. One potential competitor, Oracle Corp., is expected to field an array of Windows database-query tools by June (see story at right).

Gupta may be trying to leapfrog its strongest competitor, PowerSoft. "PowerBuilder and SQLWindows are far out at the head of the pack, and the two vendors are slugging it out," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.



Oracle tools will finally include Windows support

By Jean S. Bozman
REDWOOD CITY, CALIF.

Oracle Corp. has lagged behind vendors such as Gupta Corp. and PowerSoft Corp. in the Microsoft Corp. Windows market because its flagship tool set does not support Windows directly. But an Oracle announcement of a new generation of graphical development tools sporting built-in Windows support is expected by spring, with shipments planned for midyear.

Currently, Oracle users can write icon-based Windows applications with the desktop Oracle Card product. But the new and improved Oracle tool set will generate database-query programs for Windows in a multilayered software environment that includes Oracle computer-aided software engineering tools.

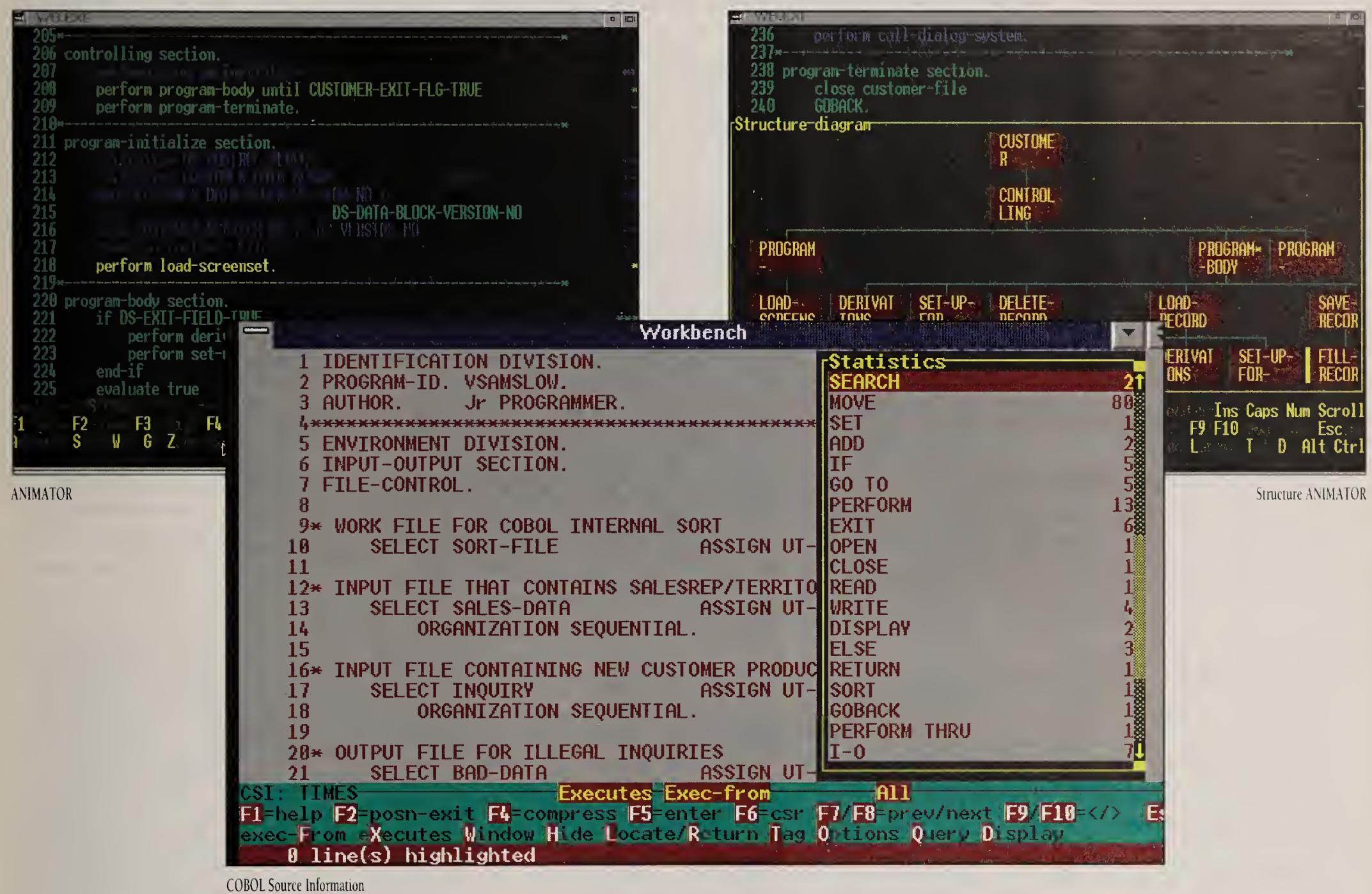
Farzad Dibachi, senior director of product marketing at Oracle, conceded that Oracle is trailing in the Windows application development market. "With Oracle Card, you can do pretty much everything you can do with [Gupta] SQLWindows, but it's not necessarily as fast," Dibachi said. Gupta also sells the SQLBase relational database server and the Quest end-user query tool (see story at left).

The new Oracle tools were originally expected to debut in 1992, industry analysts said, but development problems cropped up. To succeed in the Windows arena, applications written with Oracle's new tool set must be able to run against other vendors' databases, analysts said. That could be accomplished either through Oracle gateways to other databases or through a Microsoft Open Database Connectivity driver, which Microsoft and Oracle are developing.

The new tool set includes Oracle's SQL Forms 4.0, SQL ReportWriter 2.0 and the Oracle Toolkit utility.

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Networld's focus: Applied tech

Show gives users opportunity to explore latest in ongoing technology barrage

By Joanie M. Wexler

BOSTON

It was not a show marked by sweeping vendor announcements or networking milestones. Instead, many attendees at last week's Networld '93 simply rolled up their sleeves, attempted to digest 1992's barrage of new technologies and settled down to solve specific communications-oriented problems.

For example, Frank B. Mantha, a financial systems analyst at Niagara Mohawk Power Corp. in Syracuse, N.Y., was looking to bump up response times of field utility representatives who must be dispatched to emergency sites.

To solve the problem, he appeared ready to jump on the wireless messaging bandwagon at a booth demonstration of Fourth Wave Technologies, Inc.'s Win-Beep software. That recently announced product allows users of Microsoft Corp.'s Windows applications to "beep" roving users carrying pagers and send them alphanumeric messages.

Mantha said it looked like Win-Beep could "clean up the whole kit and caboodle" of hodgepodge

Low-cost links

The issue of cost-effectively linking remote sites into the corporate network was the biggest theme at Networld '93. To that end, Proteon, Inc. introduced a combination hub/router for sparsely staffed sites based on its low-end DNX 300 router and Series 90 wiring hub. 3Com Corp. demonstrated its remote Boundary Routing architecture, announced last month, and introduced two products in the Boundary Routing family. Boundary Routing aims to shift most of the complexity in remote routers to centralized backbone routers to simplify network configuration and management and lower per-port costs.

wireless products currently not cutting the mustard at Niagara because they either require users to make a phone call, are too heavy to constantly carry around or do not allow users to acknowledge receipt of a message.

Alternative technology

Investigating a different kind of wireless technology — radio-based local-area networks — was Ken Kuehl, research and development project manager at Ohmeda, a maker of a patient information management systems for the medical industry.

Much real-time patient data is captured in the operating room during surgery via touch-screen computers and other venues, and "there is so much spaghetti [wiring] in the operating room, you need to be heavily insured to walk into the room," he said.

However, Kuehl said he has not yet solved the issue of electrical noise from a wireless LAN interfering with medical equipment, which has strict federal emissions requirements.

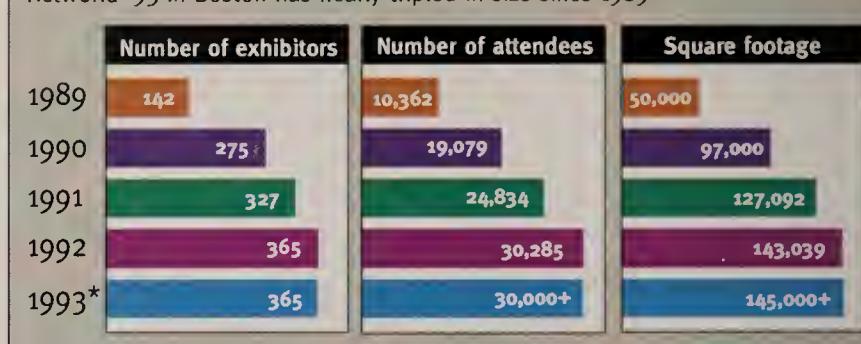
Joe E. Crick, vice president of information systems at the National Board of Medical Examiners in

Philadelphia, had a simple quest on the show floor: "I'm looking for bandwidth and plenty of it," he said.

Crick, whose organization

Growing up

Networld '93 in Boston has nearly tripled in size since 1989



CW Chart: Stephanie Faucher

writes and administers tests to license physicians, was investigating technologies such as Asynchronous Transfer Mode (ATM) for high-bandwidth applications such as computer-based simulation testing, where prospective physicians would be tested on their application of clinical knowledge rather than their memories on paper.

However, Crick has discovered

that "none of today's operating systems can deal with the virtual circuit" nature of ATM, which, unlike today's LANs, dedicates partitioned bandwidth to certain types of traffic to ensure predictable delays.

Advice on how to implement corporatewide electronic mail was what Craig Iskowitz, a senior technical staff member at Automatic Data Processing, Inc. in Mount

Laurel, N.J., said he was trying to glean. The main reason: He wants to mail-enable a labor-cost tracking system he is currently building.

However, Iskowitz's problem is that different departments use different word processors, mail systems and spreadsheets, and the formats do not translate.

"I haven't solved this yet," Iskowitz said.

Users laud NetWare 4.0 directory

CONTINUED FROM PAGE 1

same basic rights and configuration templates. This can save a network manager countless hours of adding, changing and deleting users and network resources.

However, NetWare 4.0 directory services force network managers to learn the concepts of directory "trees" and "leafs," as well as "inheritance of rights" and "inheritance filters." These abstractions are a far cry from the previous NetWare user management paradigm of adding a user or a device to a physical server.

Training needed

"We recommend that companies send a couple of network managers to be trained on the new directory service; there is definitely a learning curve," said Bob Young, Novell's product marketing manager for NetWare 4.0.

NetWare 4.0 training will be available as a two- to three-day course at Certified Novell Education Centers shortly after the software's release.

Novell plans to ease the transition between NetWare 2.x or 3.x

and NetWare 4.0 by making 4.0 directory services backward-compatible with the 2.x and 3.x server-based binderies that store user information.

"The backward-compatibility will let me upgrade one server at a time, which will make the move much easier," said Tabi Freedman, a network manager at a large securities firm who is planning to move to NetWare 4.0.

NetWare 4.0 directory services, while requiring some retraining and planning, will let firms save money in the future by employing fewer network managers and support personnel, she added.

Enterprise-wide directory services have long been available to users of Banyan Systems, Inc.'s Vines operating system. Last month, Banyan released a version of its famed StreetTalk directory services for the NetWare platform, called Enterprise Network Ser-

These abstractions are a far cry from the previous NetWare user management paradigm of adding a user or a device to a physical server.

vices (ENS). Industry analysts expect ENS to do well on medium-size, multiserver LANs.

NetWare 4.0's Windows-based management utilities were also a big hit with attendees.

"Moving users around with a point and a click, instead of re-entering their files on several different servers, will save network managers countless hours of mindless labor," said Frederick

Krug, a network consultant at Thermo Consulting Engineers.

"We have over 600 users on a lot of different servers, so the directory services are the main reason we're going to upgrade to NetWare 4.0," said Leonard Steinbach, assistant director of

computing at the State University of New York Health Services center in New York. "We're willing to invest in the retraining and rethinking if it makes managing our LANs easier down the line."

Novell has not yet announced pricing for NetWare 4.0, but it claims to have presold 10,000 copies of the product through NetWare v3.11 upgrade promotions.

Novell stakes claim in HyperDesk

Novell last week said it has purchased a 20% stake in HyperDesk Corp. and will bundle the Westboro, Mass., vendor's object-oriented software with NetWare.

Novell and HyperDesk expect Hyperdesk's Distributed Object Management System (HD-DOMS) for NetWare to be available within six months.

HD-DOMS will be used to provide standardized access to services in the NetWare environment and thus speed application development, according to both companies.

"Because HD-DOMS will allow developers to treat NetWare system software and services as objects to be reused, it will promote efficient, modular application development," said John Edwards, Novell's vice president of desktop products.

"Novell has always been weakest as an application development environment; this announcement plugs that hole and makes NetWare much more attractive to write applications to," said Jamie Lewis, vice president of The Burton Group, a Salt Lake City-based LAN research firm.

The 20% stake cost Novell an undisclosed amount of cash and stock. Novell also gains a seat on HyperDesk's board.

—Michele Dostert

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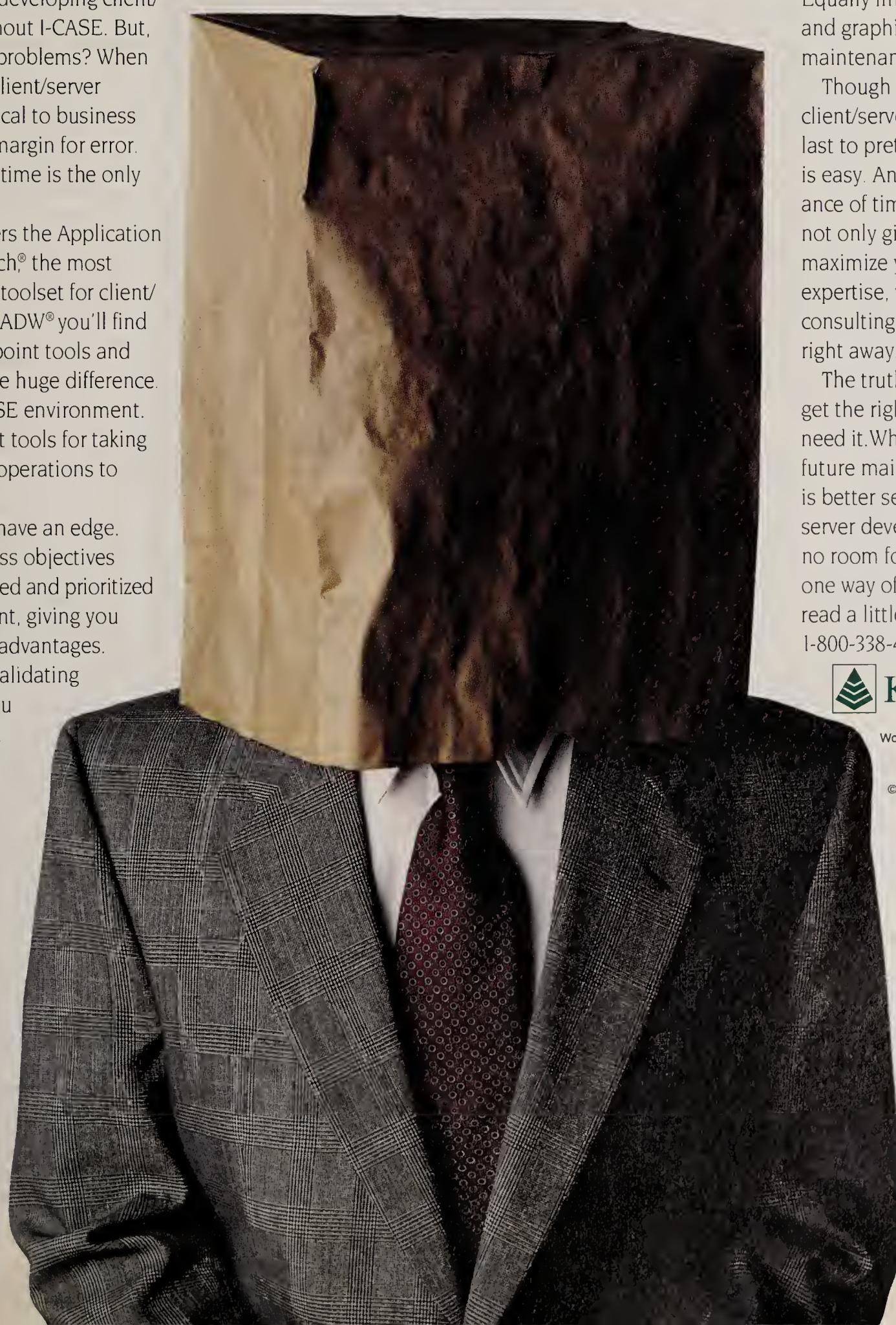
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DEC repositions Pathworks

Moves from VAX-based client/server to multinet operating system glue

By Elisabeth Horwitt

BOSTON



Environments integrated via upcoming generations of Pathworks include servers: DEC VAX and Alpha hosts running VMS, Ultrix or OSF/1, NetWare, LAN Manager, Appleshare and Windows NT; and clients: Macintosh, DOS, Windows, Unix, Windows NT and OS/2. Price is about \$200 per client.

Digital Equipment Corp. last week said it plans to put a revamped Pathworks in the vanguard of its next assault on enterprise client/server systems integration.

Currently, Pathworks is Microsoft Corp. LAN Manager-based software that enables a range of local-area network client environments to access VAX servers. Ultrix- and OS/2-based services are also available in a limited fashion. Pathworks has been competing with LAN Manager, Novell, Inc.'s NetWare and other leading network operating systems for first-time LAN installations, said Vijay Thakur, group manager in charge of DEC's engineering group.

In the second quarter, DEC will start repositioning Pathworks as a "value-added server" that will provide "interoperability and transparent client access" across a mixture of VMS, OSF/1, Apple Computer, Inc. Appleshare, Novell NetWare and LAN Manager environments, Thakur said.

The forthcoming Pathworks 5.0, for example, will enable LAN Manager, Windows NT and Workgroup for Windows clients to store and share files on a DEC Alpha OpenVMS or OSF/1 host, using native Microsoft Netbeui connections, Thakur said. Pathworks for

NetWare will do the same for Novell users via IPX.

The majority of DEC's big customers have mixed network operating system installations, Thakur said, explaining that "if a customer has 5,000 NetWare, 2,000 LAN Managers and 2,000 Unix clients, we [can] put it together."

The software glue will reside on DEC VAX and Alpha hosts, running VMS, Ultrix and OSF/1.

DEC is going after a fruitful but difficult market already targeted by the leading network operating system vendors, said Lee Doyle, director of LAN research at International Data Corp. Novell, for example, has already incorporated support for Apple and Unix environments into NetWare, and it will support Windows NT clients, if not servers, Doyle added.

Not right now, thanks

Aldon Hynes, a vice president in mortgage trading systems at the Union Bank of Switzerland in New York, said he would take a look at any future Pathworks announcements that promise to integrate his DEC VAX, Ultrix and NetWare installations. Right now, however, his company is leaning toward setting up peer-to-peer connections among these systems using the Transmission Control Protocol/Internet Protocol and Network File System, he added.

While DEC has the advantage of being a "neutral" player in the multinet operating system integration arena, Doyle questioned whether DEC — or any vendor — can provide the level of integration users want.

The next generation of Pathworks, slated to appear about mid-year, will comprise Pathworks for NetWare [CW, Jan. 11] and Version 5.0 of the original, LAN Manager-based Pathworks. Both will let LAN Manager or NetWare clients access DEC host file- and printer-sharing services. DEC plans to add centralized backup of multivendor network operating systems at an undisclosed date.

Another key part of this upcoming Pathworks generation will be administration of multivendor server environments from a single PC running Microsoft Windows.

The user will be able to click on a server, call up client configurations and profiles and monitor network operating system operations, he added. The administrator will also be able to distribute software and configurations to multiple, remote multivendor client and server systems, Thakur said.

Later this year and into next year, Pathworks will provide concurrent file access for a mixture of LAN Manager, Appleshare and NetWare clients on the same DEC host, Thakur said.

additional network connections.

Similarly, at Commonwealth Edison in Chicago, "there are several situations where we don't have enough ports and must buy more routers," said engineer Jon Castle.

The utility also anticipates a heavier traffic load, which would demand Cisco 7000 performance "in a year or two."

To date, Cisco has faced "performance and slot space limitation," added Coyne Gibson, manager of information technology at Convex Computer Corp. in Richardson, Texas, a Cisco and Coral shop.

The new router should allow up to 28

has surmised an architectural overhaul to address these shortcomings, a Cisco spokesman said the architecture will not change dramatically. The spokesman said, however, that the Cisco 7000 will require modification for hot-swappable capabilities.

"The most important thing is hot-swapping," said Victor Duchovni, a senior systems analyst at Lehman Brothers.

"Until now, one has had to schedule downtime for servicing Cisco routers. Ports have been difficult to install, add and control."

Scott Bradner, a consultant at Harvard University's Office of Technology,

said the Cisco move should address "reluctance by corporate telecommunications managers to embrace the unreliability the current router generation tends to have."

Equipment in the telecom world has always been reliable and hot-swappable, he said, which has elevated network managers' expectations of network uptime.

Cisco will also build on last week's ATM-oriented alliance announcement with AT&T and StrataCom, Inc. by filling out an ATM strategy it outlined last fall.

While "Cisco does not have an ATM switch under development," according to the Cisco spokesman, Cisco "might partner to get it."

AT&T, Cisco, StrataCom pool ATM efforts

By Joanie M. Wexler

NEW YORK

■ Three leading network vendors teamed up last week to fuel the progress of Asynchronous Transfer Mode (ATM), a move that could accelerate key interface and network management standards for the fledgling high-speed network.

AT&T, router market leader Cisco Systems, Inc. and frame-relay switch maker StrataCom, Inc. said they will cooperate with one another as well as with standards bodies to develop and implement ATM, a switched network for carrying data, voice, video and image traffic in both local- and wide-area networks [CW, Jan. 11].

Users were generally encouraged. "It is important to go to cell relay [the underlying ATM transport] to integrate voice, data and video and minimize bandwidth costs," said Paul Weekes, director of information technology management at Motorola, Inc. in Schaumburg, Ill. Motorola uses AT&T as its major carrier and StrataCom technology in the form of a Codex 6290 multiplexer.

Weekes said he is shooting for ATM pilots by the end of the year for engineering visualization and multimedia applications.

"If I used any or all of these vendors, I might really be excited," said Bill Reiss, a systems engineer at Swiss Bank Corp. in Chicago. "But sometimes these alliances can be a two-edged sword. They can speed deployment but can sometimes hurt other competing vendors."

Monumental move

But Todd Dagres, vice president of communications research at The Yankee Group, a Boston consultancy, said he found it significant that "the three major players in their respective areas are cooperating on interoperability" at all levels necessary for a seamless ATM network.

As part of the announcement, AT&T Network Systems and StrataCom announced ATM switches that will link to deliver AT&T's ATM network service. AT&T's GNCS-2000 will make up the AT&T ATM backbone, and the smaller scale StrataCom BPX will hook the backbone to dispersed sites. AT&T said it will announce ATM service availability in the coming weeks.

The first area of AT&T/Cisco/StrataCom collaboration will be ATM-to-frame-relay networking, which could fuel deployment of both technologies. Users questioning whether they should bypass frame relay and wait for ATM might gain peace of mind knowing they have an ATM migration path.

AT&T competitor Sprint Corp. plans to have ATM service available late this year or early 1994. Sprint has articulated a data platform migration plan through 1995 similar in concept to the Cisco/StrataCom/AT&T move, except Sprint has not teamed with a LAN vendor.

MCI Communications Corp. has an ATM-ready platform in place and will deploy service "when the demand is there," an MCI spokeswoman said.

Cisco to reveal plan

CONTINUED FROM PAGE 1

router architecture and those of competitors Wellfleet Communications, Inc. and Coral Network Corp. These vendors' newer architectures accommodate larger numbers of networks and are more expandable.

"We're anxious to get some of that technology," said John Kostakos, internet-work manager at Lehman Brothers, a Cisco shop in New York. He said he foresees emerging multimedia and scanning applications soon stressing the 65,000 packet/sec. throughput of his high-end Cisco AGS+ routers.

Sources close to

Cisco said the Cisco 7000 will forward 100,000 packets per second, an increase that will be achieved through redirecting some local-area network attachments from a lower speed bus to Cisco's half-gigabit backplane and software enhancements.

Kostakos added, "Real estate is an issue. Getting more performance out of a single box [supporting more network connections] means we're better off in terms of space than buying multiple boxes."

The new router should allow up to 28



APIs crowd E-mail arena

By Lynda Radosevich

BOSTON

The long-simmering mail application programming interface (API) controversy resurfaced at Networld '93 last week with the unveiling of a new faction led by Novell, Inc.

Called the MHS Alliance, the group — which includes Beyond, Inc., Da Vinci Systems Corp. and Central Point Software, Inc. — trumpeted Standard Message Format, the little-known, file-based API that is layered on top of the Message Handling Service (MHS) delivery system.

Other APIs fighting for user mind share are Lotus Development Corp.'s Vendor Independent Messaging (VIM), Microsoft Corp.'s Messaging Application Programming Interface (MAPI) and the X.400 Application Programming Interface Association's (XAPIA) Common Mail Call (CMC). The APIs share the function of interfacing with applications but vary in their levels of capability.

While some users said they wished vendors would solve their differences and pick one API, others said particular APIs suited their needs.

"The issue is not choosing which API but choosing among them," said Joe Caruso, director of corporate information systems and technology at American Express Co. in New York. "The XAPIA has done excellent work with open APIs, which certainly offer benefits, but there may be some platform-specific applications where it will be fine to use other APIs as well."

Analysts agreed that the APIs offer different benefits:

- According to David Coursey, editor of "P.C. Letter," an industry newsletter in San Mateo, Calif., MAPI, which does not

yet exist in a way usable to developers, is intended to mail-enable Microsoft Windows applications and provide links to Apple Computer, Inc.'s Open Collaborative Environment.

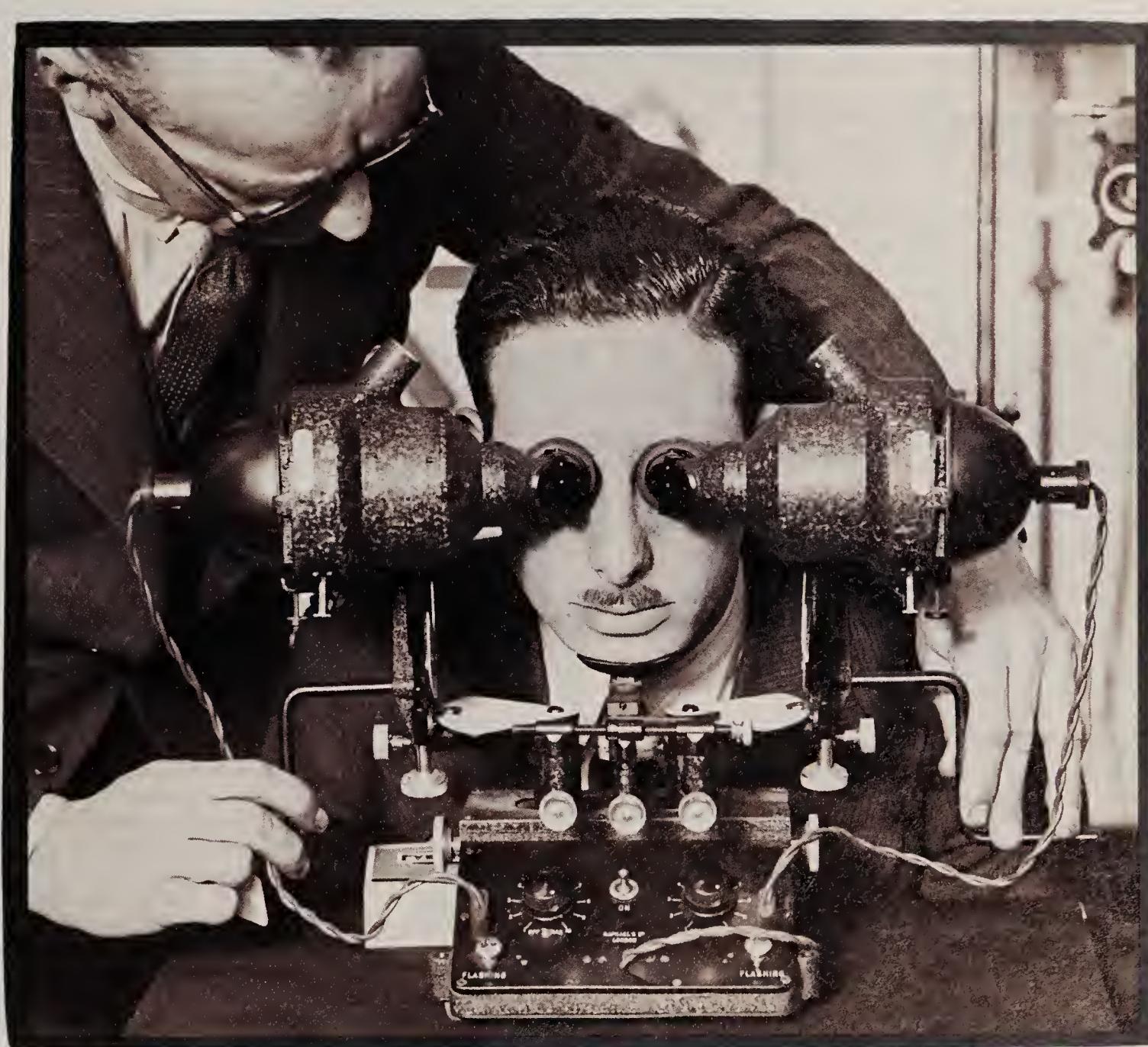
- VIM — which is available and is already being used in products by developers such as Jetform Corp. — offers to mail-

enable applications across platforms other than Windows and Macintosh, such as DOS.

- The CMC interface will initially be a limited set of calls that transcend VIM and MAPI and allow message-enabling across all hardware platforms, including mainframe platforms.

MHS, which is used mainly by Novell NetWare customers, has the advantage of being a widely deployed "de facto standard," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif.

"I'm happy to see vendors getting on the MHS bandwagon," said Larry Chapin, systems support specialist at Golden Aluminum, a recycling company in Golden, Colo. "I don't have the extra dollars to put into leading-edge products that might disappear."



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Pssst!

Networld '93's electronic-mail highlights include the following:

- **WordPerfect Office 4.0**, seven electronic messaging products from WordPerfect Corp. that will ship this spring. Office 4.0 includes E-mail, personal calendaring and group scheduling. It is priced at \$495 for a five-license package.
- Sneak previews of **CC:Mail for Windows 2.0**, which Lotus said will ship in the first quarter. Version 2.0 adds automatic message routing using rules-based scripting, message previewing and the ability to drag addresses from a list and drop them into a message.
- **Microsoft Mail Remote for Windows**, the first remote E-mail client for Windows, according to Microsoft. The program, which is slated to be available next month for \$195, has the ability to read and create messages off-line.

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News Shorts

Fault resilience new from NCR

NCR Corp. this week will introduce the first in a set of fault-resilient software products for its System 3000 midrange computer systems. The first product, called LifeKeeper FRS, provides NCR's 3400 and 3500 system users with increased availability, automatic failure detection and recovery from system, application and component failures. LifeKeeper FRS, which is compatible with communications interfaces such as Transmission Control Protocol/Internet Protocol and IBM's Systems Network Architecture, is priced starting at \$6,000 per uniprocessor. Later this year, NCR will also begin shipping LifeKeeper FRS Clusters, a fault-resilient package designed to provide redundancy between clustered NCR System 3000 machines.

DEC loss less than expected

Digital Equipment Corp. last week announced financial results for the second quarter that were significantly better than those anticipated by analysts [CW, Jan. 11]. The firm reported a net loss of \$73.8 million, compared with a net loss of \$155.2 million in the same quarter a year ago. Revenue grew by 6% to \$3.68 billion. DEC officials attributed the improved results to the stabilization of VAX sales, growth in sales for DEC PCs and workstations and cost slashing. The company now employs 102,500 people.

Oracle 7 delivered for VAX

Oracle Corp. said it has shipped the first production copies of its Oracle 7 relational database to users of DEC VAX/VMS systems. The shipments include production code, development tools and three optional packages for distributed database, PL/SQL programming and parallel-processing servers. Oracle 7 was announced in June 1992.

Microsoft, Intel gain on IBM

Nowhere is the industry's changing of the guard more apparent than on Wall Street. In the near future, securities analysts said they expect the value of Microsoft Corp.'s stock to bypass IBM's. As of late last week, IBM held a slight edge: \$27.83 billion vs. \$27.78 billion. Intel Corp. is also gaining rapidly on IBM; it rally drove its shares up 14 points to 112.75 — giving its stock a \$24.47 billion valuation.

Further pumping up the volume

Dwayne Walker, Microsoft's director of Windows NT and networking products, said the company last week upped its estimate for the number of Windows NT developer kits shipped from 30,000 to 45,000. Before NT ships in midyear, Microsoft will have placed copies of its 32-bit operating system at 20,000 to 25,000 beta-test sites, Walker predicted.

SHORT TAKES Texas Instruments, Inc. and Zenith Data Systems resolved pending litigation for a licensing agreement with Zenith Data agreeing to pay royalties to TI for use of its microcomputer patents.... DuWayne J. Peterson, a former executive vice president at Merrill Lynch & Co., has been named to the board of directors at AI Corp., an Alameda, Calif., integrator of document imaging applications.... Borland International, Inc. termed "baseless" allegations of securities laws violations contained in a class-action lawsuit. The suit was filed by a group of investors who purchased Borland stock between March 5, 1991, and April 27, 1992.... Lotus Development Corp. and Isocor demonstrated software at Network '93 in Boston that allows Lotus' Notes users to transport Notes multimedia documents over public and private networks using X.400 messaging standards.

HMO outsources to ISSC

By Nell Margolis
OAKLAND, CALIF.

Kaiser Permanente, the nation's largest health maintenance organization (HMO), last week announced an approximately \$70 million, 10-year data center management and technology development contract with IBM subsidiary Integrated Systems Solutions Corp. (ISSC).

The outsourcing deal, its first, is a big one for Kaiser, which has an estimated 6.6 million members. The huge HMO hopes to graft its new ally's technological clout and information systems strategic sophistication to its so-called "ex-

pansion regions," which represent 8.5% of its membership, said Kaiser Interregional Services Vice President Andy Dubill.

In addition, ISSC will give a systems and support booster to Kaiser's Portland, Ore.-based applications development group.

The five expansion regions now outsourced to ISSC are Georgia, North Carolina, Texas and the Hartford, Conn., and Kansas City, Mo., areas. Arming these relatively small but promising regional centers with a slew of IBM management, support and services — particularly in the disaster recovery area, which is so critical to medical organizations — could be key to exploiting their growth po-

tential without depleting their budgets, Dubill added.

Under the agreement, these regions, whose IS operations will be consolidated and run out of ISSC's Lexington, Ky., data center, will get a communications bonus.

"We had already put in T1 links between the locations, and we don't need all the bandwidth we've got," Dubill explained. "So ISSC is going to install videoconferencing facilities."

Kaiser's remaining seven regions, including its approximately 5 million-member Northern California stronghold, have no plans to outsource, Dubill said — largely because they have IS outfits that sufficiently meet their needs.

some outsourcingers said ISSC's use of IBM's sales team violates antitrust regulations.

Welsh claimed marketing in the outsourcing business is often a matter of referrals, rather than traditional campaigning. He said deal-making is a key element to winning contracts and that last week's addition of four vice presidents to ISSC sharpens the subsidiary's deal-making acumen.

Julie Schwartz, associate director of professional services at San Jose, Calif.-based Dataquest, Inc., said ISSC's deal-making abilities were key to its recent success.

Just how well ISSC is performing should become clearer in March, when, according to Welsh, IBM plans to break out ISSC's financials in its annual report.

Observed Sam Albert, a consultant in Somers, N.Y., "IBM is trying to make a transformation from International Business Machines to International Business Services."

Wheeling and dealing

While ISSC was announcing its organizational changes and its Kaiser Permanente deal last week, it was also busy signing its latest outsourcing deal: a 10-year pact with Qualex, Inc. in Durham, N.C.

Qualex, a film processing business, is 49% owned by ISSC client Eastman Kodak Co., which may have helped ISSC wrestle the deal away from Computer Sciences Corp. (CSC). CSC had won a letter of intent from Qualex late last fall but received a "Dear John" notification from the company Dec. 31 [CW, Jan. 11].

Meanwhile, ISSC is working its way through a good news/bad news scenario with Dallas-based jeweler Zale Corp. The good news is that Zale, which entered Chapter 11 proceedings shortly after signing an outsourcing contract with ISSC roughly a year ago, has decided to stick with the subsidiary. As part of a corporate reorganization, it had been considering giving ISSC the boot.

The bad news is that the deal will apparently be pared back in scope. ISSC and Zale are in the process of renegotiating the contract. —Mark Halper



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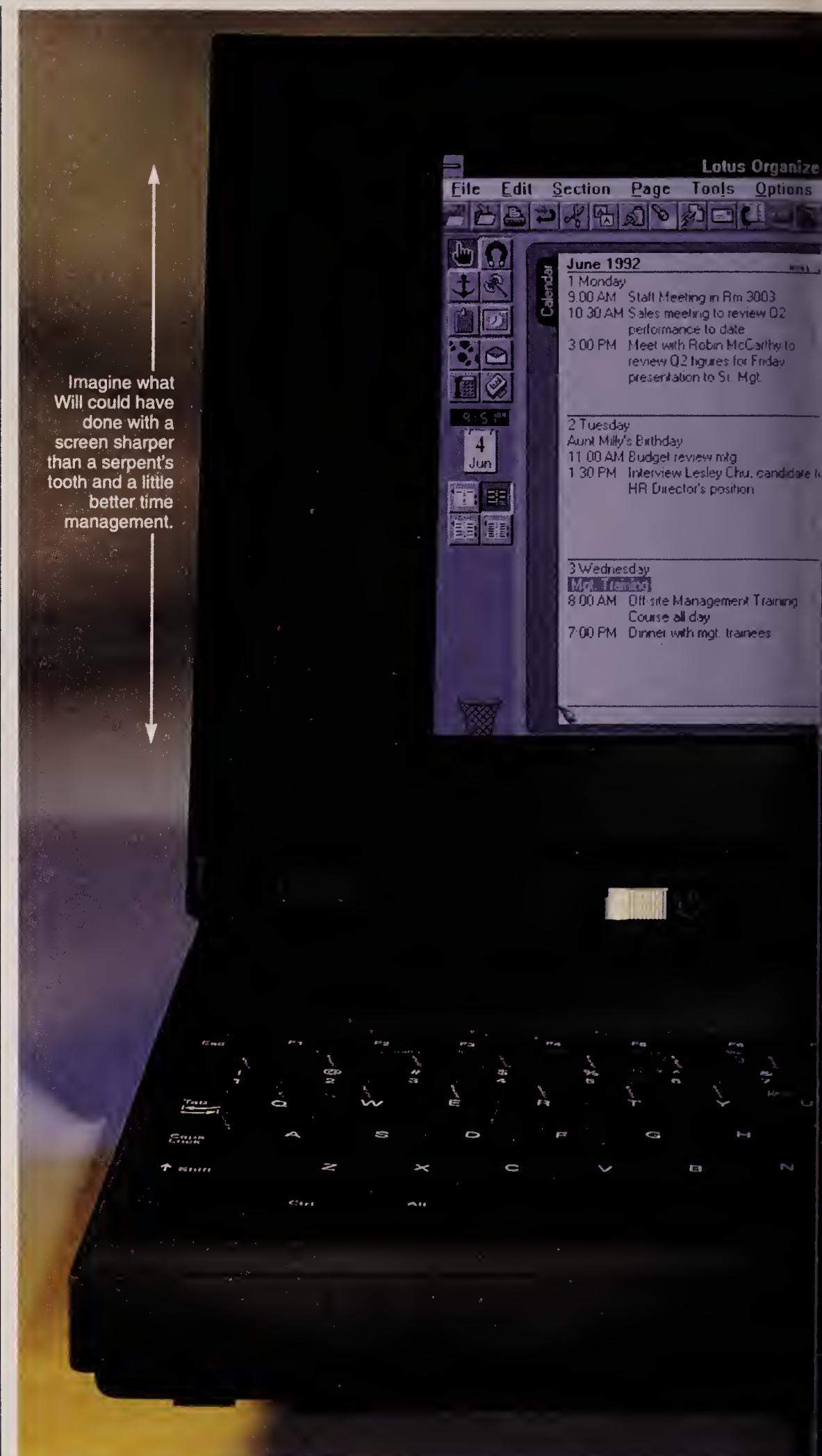
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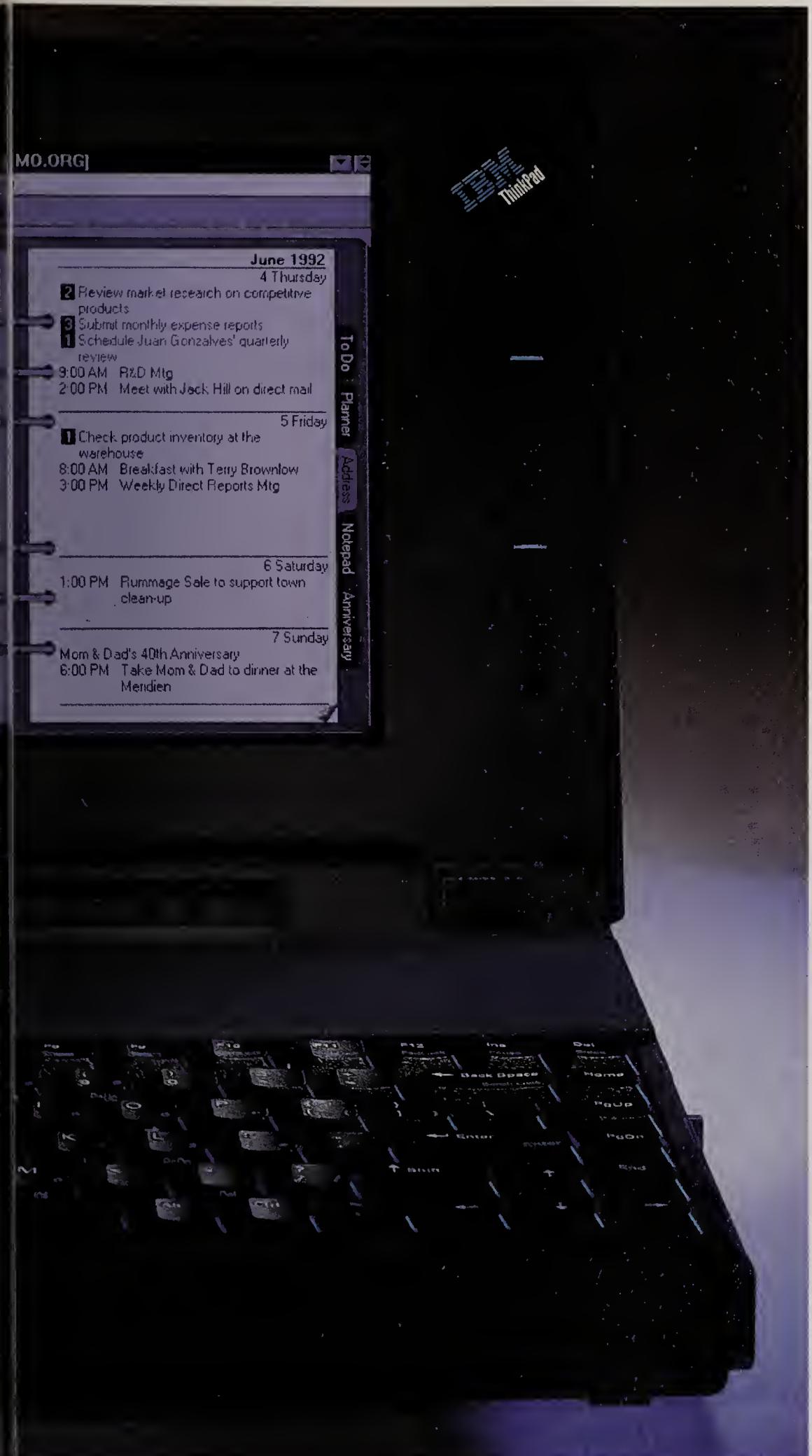
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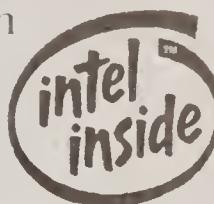
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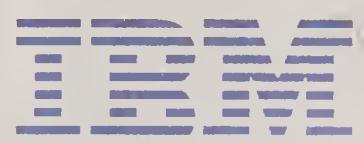
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FTC targets credit bureau mailing lists

By Mitch Betts
WASHINGTON, D.C.

The Federal Trade Commission (FTC) is trying to stop the nation's credit bureaus, which hold vast computer databases on nearly 200 million Americans, from using credit reports to create highly

targeted marketing lists.

Last week, the FTC charged Trans Union Corp. with violating consumer privacy by mining its credit reports to sell mailing and telemarketing lists of consumers who fall into certain income ranges or "affluent lifestyles."

Trans Union, based in Chicago, said it

has done nothing illegal and will fight the charges. The case is slated to go before an FTC administrative law judge on March 16.

The agency also reached a proposed settlement with TRW, Inc.'s Information Services Division in Orange, Calif., in which TRW agreed to discontinue the

same practice. Atlanta-based Equifax, Inc. saw the regulatory backlash coming and escaped that business niche two years ago.

The FTC action comes at a time when many marketers are compiling databases on consumers, categorizing them by financial status and lifestyle. However, the FTC said credit reports may be used only for certain purposes—approving applications for loans, jobs and insurance—and not for marketing lists unrelated to credit.

Credit bureaus will be allowed to create lists from the name, address, telephone number and age listed at the top of credit reports, the FTC indicated, but they will be unable to draw from the financial data in the credit report.

Direct marketers can get the financial data from other sources, but the FTC action "is still positive news for consumers," said Mary J. Culnan, an associate professor and consumer privacy expert at Georgetown University. "Most people don't have a clue that their credit report is being used for marketing."

Credit bureaus have been besieged by criticism during the last few years over privacy issues and database errors and have reached settlements with federal and state regulators to correct the problems.

Last month, TRW agreed to pay restitution to 1,200 Vermont residents who were incorrectly listed as tax defaulters.

Operating system show lacks business appeal

By Christopher Lindquist
SAN JOSE, CALIF.

Attendees at this week's Windows & OS/2 Conference will likely find an emphasis on consumer-oriented, Windows-based software vs. OS/2-based, line-of-business applications. However, show-goers will encounter demonstrations of software written for Microsoft Corp.'s Windows NT from a large number of companies.

Jeff Tarter, publisher of the "Soft Letter" newsletter in Watertown, Mass., said he finds these demos "fascinating," considering Windows NT is not due to debut until May — perhaps at Comdex/Spring '93.

For the most part, though, Tarter described the conference as "just another consumer show. What you got in the early days were true Windows pioneers."

Among the products that will be floated at the show are the following:

- GFA Software Technologies, Inc. will unveil a Compiler/Linker for GFA Basic that will allow the product to create stand-alone EXE, DLL and VBX files.
- Graphical Dynamics, Inc. will present Clock Manager for Windows, a Windows automation package.
- Caseworks, Inc. will demonstrate CASE:PM VIP and CASE:W VIP, prototyping tools for OS/2 and Windows.
- Softbridge, Inc. will release ATF Work Station, an unattended testing product for OS/2 applications.

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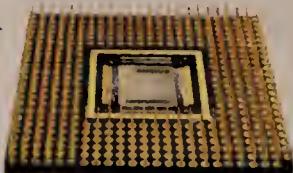
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Industry CEOs push national digital net

Commerce Secretary-designate Ronald H. Brown said to support the plan

By Gary H. Anthes
WASHINGTON, D.C.

Chief executive officers from 13 major U.S. computer companies met here last week with Commerce Secretary-designate Ronald H. Brown, saying he pledged to support their plan for a government/industry partnership to build a national digital information infrastructure.

The CEOs proposed building a National Information Infrastructure (NII), a broadband digital internetwork connecting computers and people to bring medical care, interactive training, advanced manufacturing techniques, government data and the like to broad sectors of the country.

"Ron Brown has quickly taken the initiative to build what I believe is going to be a very strong relationship with the high-technology community," said John Sculley, chairman of Apple Computer, Inc. and chairman of the Computer Systems Policy Project (CSPP), which met with Brown. "He made it very clear to us that he would consider [the infrastructure] a very major accomplishment during his tenure as secretary of commerce."

Reaching homes and offices

The CEOs were in town to announce and lobby for a new round of proposals that would extend the government's existing high-performance computing and communications program—largely initiated by Vice President-elect Albert Gore—beyond the realm of government and university laboratories into offices and homes across the country.

The centerpiece of that program is slated to be the National Research and Education Network (NREN), a digital network to link universities and government laboratories at G byte/sec. speeds.

The network proposed last week would have far greater reach and broader application than the NREN is intended to have.

In addition, the CSPP called on the Clinton administration to establish a NII Council—to be chaired by the vice president and to include the secretary of commerce, the president's science adviser, the chairman of the Federal Communications Commission and representatives of industry and user groups—to develop a vision for the NII and coordinate federal agencies in implementing the effort.

Private-sector funding

Sculley estimated that it would take 20 years and "multiple hundreds of millions of dollars" to build the infrastructure and said the private sector is willing to fund most of it. He said the government did not need to find new money for federal participation but should reallocate billions of dollars from defense research and development to civilian uses such as the NII, which is something Clinton has pledged to do.

Asked if the infrastructure required laying fiber-optic communication cables to every home, business and classroom, as the telephone companies and others favor, Sculley said the envisioned collection of interconnected networks could

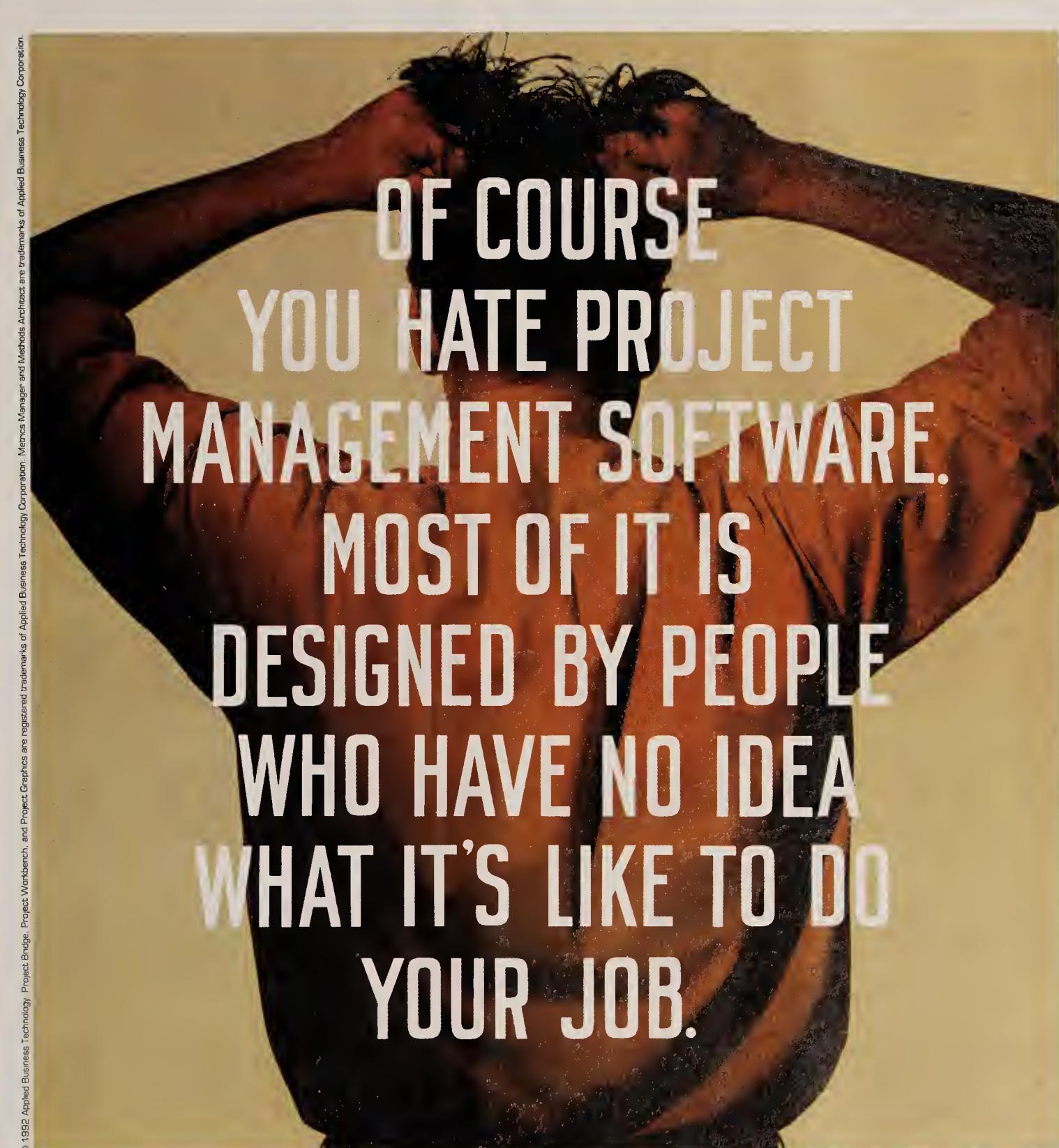
use a variety of technologies, including the copper-based Integrated Services Digital Network.

"Fiber to the home is not affordable right now," Sculley said.

The CSPP also recommended that the

government do the following:

- Establish an entity, perhaps in the Commerce Department, to oversee and guide implementation of the vision developed by the NII Council.
- Fund pilot projects to demonstrate socially worthy applications of high-performance computing and communications.
- Develop a public information program for the NII.
- Make government data more accessible to the public.



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The ubiquitous, omnipresent PC

By David Kellar

By the dawn of the next millennium, PCs will disappear from the desktop because they will *become* the desktop, a Japan-based research group studying future computer trends predicted.

The three-year study, scheduled to end in March, is being conducted by the Committee on Computer Systems in the Year 2001, a group of 18 researchers from major Japanese corporations, computer companies and universities.

By far the most intriguing prediction by the group is that PCs will vanish from the desktop in corporate offices and become an integrated part of the work space.

The components of a PC, rather than being packaged in a box, will be built into the desk, and a large plasma or electroluminescent flat-panel display hanging on a partition wall will act as both a monitor and video phone display.

A high-resolution, touch-sensi-

tive LCD built into the desktop will allow pen-based pointing and data input. When faster performance is required, users will buy new computer modules to plug into their desks.

In the home, meanwhile, computers will become as ubiquitous as TVs and will allow users to shop, send and receive electronic mail, view incoming faxes and make visual telephone calls all from an easy chair, with input carried out using a handheld remote terminal or a separate portable computer.

Computer interfaces will be far friendlier than the point-and-click, mouse-driven graphical user interfaces of today, according to the group.

"Human interface technology will actually be more important than computer performance in 2001," said Hajime Iizuka, a professor at Seikei University's De-

partment of Information Sciences and chairman of the 2001 study committee.

The group also predicted the following will occur:

- Japanese companies — in order to gain the flexibility and cost-effectiveness necessary to remain competitive in global markets — will give up their long-entrenched, proprietary computer systems and replace them with networked, Unix applications.
- Most corporate applications will be transplanted from mainframes to workstations.
- Downsizing from mainframes to distributed client/server systems will all but eliminate minicomputers and midsize mainframes from corporate computer rooms, and large mainframes will be relegated to the sole task of managing huge Unix databases.
- Workers will use high-perfor-

Computer interfaces will be friendlier than today's point-and-click, mouse-driven GUIs.

mance handheld computers with wireless communications functions.

- Reduced instruction set computer microprocessors will finally obliterate the ever-thinning gap between workstations and PCs.
- Computers will use "human interfaces" based on multimedia.
- There will be widespread use of broadband Integrated Services Digital Network communication for high-speed transmission of multimedia data.
- Chip design and manufacturing techniques will continue to evolve to yield 256M-byte memory chips and experimental 1G-byte dynamic random-access memory.

Similar advances in nonvolatile flash memory will lead to the replacement of magnetic hard disks with electronic "silicon disks," that enable significant size and weight reductions in portable computers.

Kellar is the Tokyo correspondent for the IDG News Service.

Attention, Will Robinson!

The commercial use of robots has only just begun

By Ellis Booker

A broken fiber-optic cable prevented Dante, a six-eyed, eight-legged robot, from making its historic descent into the active Mount Erebus volcano in Antarctica last month.

But the Field Robotics Center at Carnegie Mellon University in Pittsburgh, a veritable beehive of activity on "self-propelled" robots, remains confident that Dante and systems like it will make their way into wide-scale commercial use in the future.

"We're just now reaching a threshold," said David Pahnos, assistant director of the center, who noted that field robots make possible totally new applications.

"But the bigger impact," he added, "will be the automation of a lot of existing lines of products ... in construction, earth moving, transportation and farming."

Described as a precursor for robots that will be sent on uncrewed missions to other planets, Dante stands 8.2 feet tall, weighs 884 pounds and is controlled by two Sun Microsystems, Inc. SPARCstations. Dante is also chock-full of state-of-the-art sensors, ranging from a 350-degree, three-dimensional vision system and laser range finder to sensors that check pressure, temperature and electrical fields around each foot. (Fans of the 1960s adventure cartoon, *Jonny Quest*, take note: Dante is reminiscent of the lethal, black spider robot.)

The lab is also at work on less exotic uses of robotics. For instance, it will soon begin development of a robot snake able to inspect the interior of gas or diesel storage tanks.



Robots like Dante may someday be sent on uncrewed exploratory missions into space

But will a homeowner ever go to the garage and turn on a robot lawnmower? "I think it's inevitable," Pahnos said, adding that the center today could build an "autonomous" lawnmower but would have to charge \$250,000 to \$500,000 for it.

Dante, having survived its brush with Mount Erebus, will return to Pittsburgh and rejoin the planetary rover research effort.

Just don't let them loose at a picnic . . .

Instead of an 8-foot-tall spider, how about a robot smaller than a fingernail that looks like an ant?

Johannes Smits, an associate professor of electrical engineering at Boston University's College of Engineering, is working on just such a bug [CW, Jan. 6, 1992], although he admitted that he has been unable to get funding for his "silicon ant," which is already patented.

"If we had the right amount of funding, we could have this thing working in a couple of months," said Smits, who is also director of the engineering department's sensors, actuators and micromechanics laboratory.

Smits is currently testing his first completed "leg." Composed of two tiny strips of piezoelectric film and a V-shaped piece of silicon as a foot, the leg moves up and down when exposed to a small amount of voltage. Plans call for six pairs of legs on the 3- to 7-mm ant, which might also be outfitted with tiny pincers, saws or image sensors.

Armed with silicon ants might locate and remove radioactive dust from laboratories or scurry between petri dishes in biotechnology labs.

"We envision many, many of them, on the order of hundreds or thousands, to do a particular job," Smits said.

— Ellis Booker

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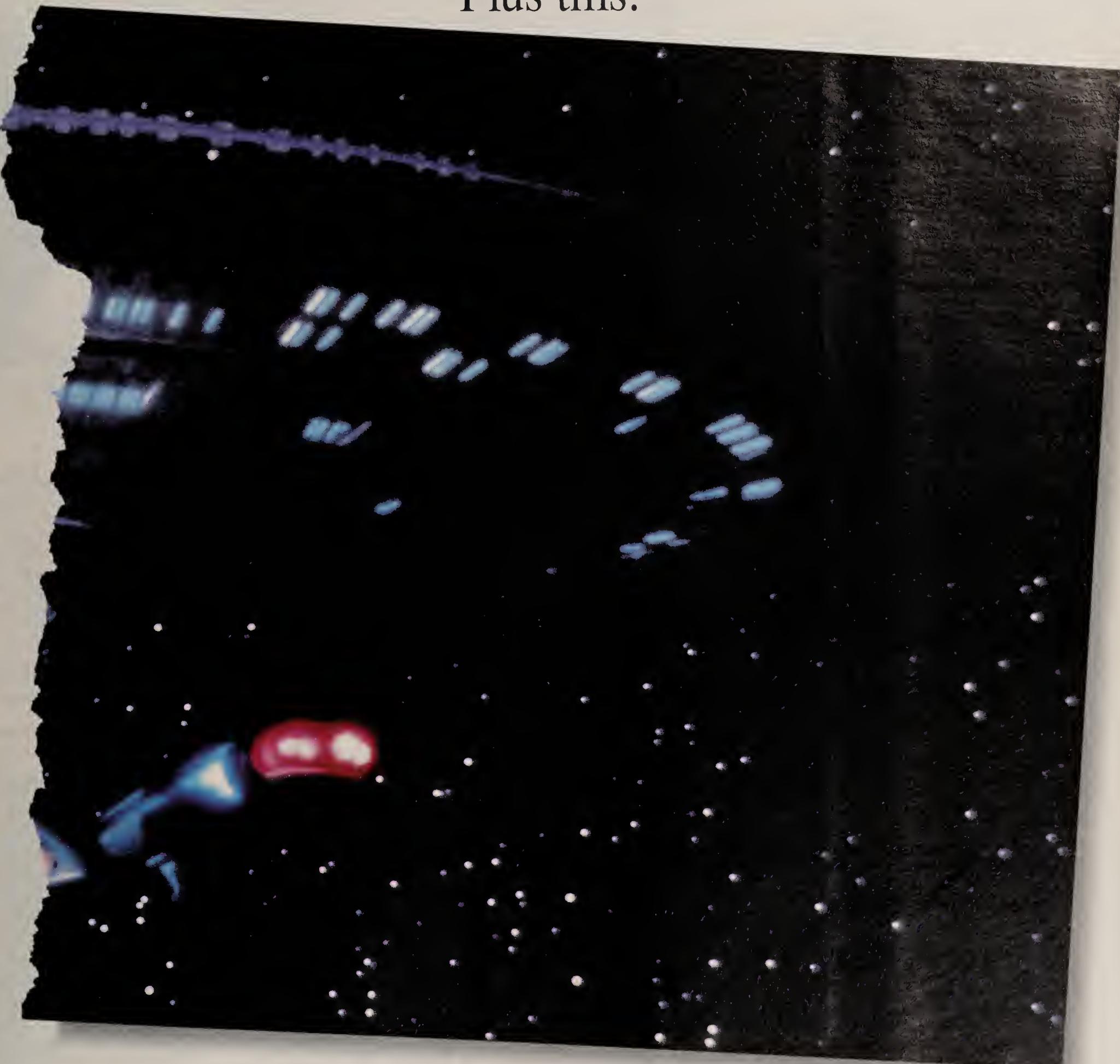
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Editorial

NT promises

"We want IS people to be loved in their organizations. It's necessary to our success."

Is the speaker: a) an IBM vice president, b) an Oracle vice president or c) a Microsoft vice president?

Believe it or not, the correct answer is "c." Patty Stonesifer, Microsoft's vice president of support, nearly knocked me off my chair last week when she made that statement during a discussion of Microsoft's wide-ranging plans to improve its oft-maligned corporate support. Is this the same Microsoft that was practically the guerrilla leader of the PC end-user movement and the archenemy of corporate information systems?

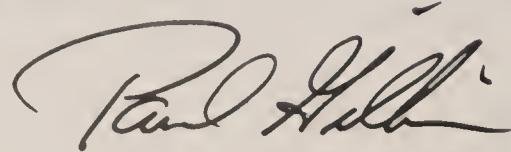
Well, yes. Microsoft is becoming a very different company as it comes to grips with the reality that corporate IS now sees it as every bit as much a strategic partner as IBM or DEC. Microsoft seems a bit befuddled by this newfound coziness with the group it has so long opposed, but the company is rushing to capitalize on it as it prepares to release its most corporate of operating systems: Windows NT.

NT is an enormously ambitious product and is critical to Microsoft. Far from positioning it as just another PC platform, Microsoft is hoping to convince corporate America that NT will be appropriate for everything from high-end desktops to mainframe-class multiprocessors.

NT will be launched into a high-end market that is already overwhelmed with operating system choices. Microsoft has laden the product with a lot of impressive claims about security, maintainability and scalability that it will have to fulfill as NT rolls out this year. I think Microsoft knows that NT won't get beyond the desktop unless IS departments know that the company considers them a crucial link in the vision of information at your fingertips.

But if anyone can pull this magic show off, Microsoft can. The company claims to have shipped more than 45,000 NT software development kits already, and that's a truly incredible number. It boasts that high-end software developers are moving their applications in volume to the NT platform, a claim borne out by my own nonscientific poll of developers during the last few weeks. And NT will have the huge advantage of being compatible with most of the major Windows applications from Day 1.

The wild card in this game is corporate IS, which, after all, knows quite a lot about mission-critical platforms. For CIOs, spiffy technology and snazzy interfaces matter a lot less than software stability and a sense that their vendor has their interests at heart. That's why you're suddenly seeing Microsoft executives at SIM conferences and hearing about things like 24-hour support plans. It's not just lip service. If Microsoft can prove it really cares about making IS professionals loved in their organizations, it just might make NT the operating system of the next decade. It certainly wants to do that.


Paul Gillin, Executive editor



Letters to the editor

Why the change of heart?

I find the irony in your Forecast 1993 issue [CW, Dec. 28, 1992/Jan. 4, 1993] fascinating.

For 52 consecutive weeks, you have been writing and reporting stories pronouncing the death of the mainframe, implying the whole world is either downsizing or outsourcing and that client/server is the most incredible thing since sliced bread. Then in a whirlwind revelation, you report that these are for the most part "myths."

This leads me to one of two conclusions: For an entire year, your writers and analysts have been seriously misled. In a bizarre coincidence occurring at the exact time of your first issue of 1993, it has dawned on them that these subject matters are nothing more than "myths," much like Bigfoot and The Loch Ness Monster. Or, your writers feel an approach of sensationalism sets a foundation for an exciting crescendo at year's end.

Gregory M. Lorenz
Costa Mesa, Calif.

Saluting the pioneers of banking technology

It is somewhat (if belatedly) gratifying to see that your first-ever Excellence in Re-engineering Award was presented to Banc One Corp. for its work in revolutionizing the banking sales and service industry [CW, Dec. 14, 1992].

You aptly point out that the cooperative development partnership with EDS that brought forth

the technology is so richly deserving of this lavish praise.

I'd just like to take a moment to acknowledge the contributions of Anacomp, Inc. and its 460+ employees who began this project in the late 1970s and early 1980s.

These pioneers not only originated these ideas but also provided the core systems and personnel that EDS purchased at a distress sale in the mid-1980s. The ill-fated CIS project has risen from its ashes like the mythical phoenix, and those who participated in that monumental project, now mostly scattered again to the four corners of the country, should stop and take a bow, too, wherever they are, as this elusive dream has finally become a reality.

My congratulations to the current team who brought forth this latest incarnation of totally integrated banking systems and to the insightful and brash band of Anacompans who originated the concept and gave so much of themselves to breathe life into it.

Frank J. Ingrassia
Sarasota, Fla.

Out with the old, in with the new

Change replaces old rules with new, old skills with the need for new ones, and competence with incompetence. Is it surprising that change hurts?

Both your editorial cartoon and Alice Bredin's article "Make yourself too valuable to lay off" [CW, Dec. 28, 1992/Jan. 4, 1993] point to a crisis in the information systems industry. IS professionals must change skills as fast as they have asked their clients to change sys-

tems in the past. If they don't, the unskilled labor force in the year 2000 will consist of hordes of mainframe programmers and analysts.

It has been my experience that IS professionals fear change more than their users. They have years of technical training and expertise invested in their careers. Giving up this investment is difficult, but yesterday's skills will neither build the systems of tomorrow nor make you "valuable to your employer."

Peter de Jager
Brampton, Ontario, Canada

Bad advice

I read with horror Michael Cohn's Viewpoint article "The 'Ize' have it" [CW, Dec. 21, 1992]. It was very unprofessional and irresponsible for you to print such an article.

First Amendment rights aside, it is unacceptable for an information systems publication to print an article that encourages computer professionals to "terrorize, destroy a disk pack, create a crisis" in order to keep IS employment levels high.

Scott Shinberg
Alexandria, Va.

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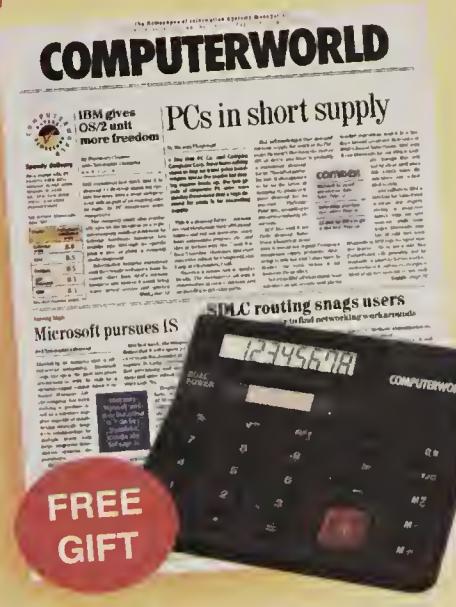
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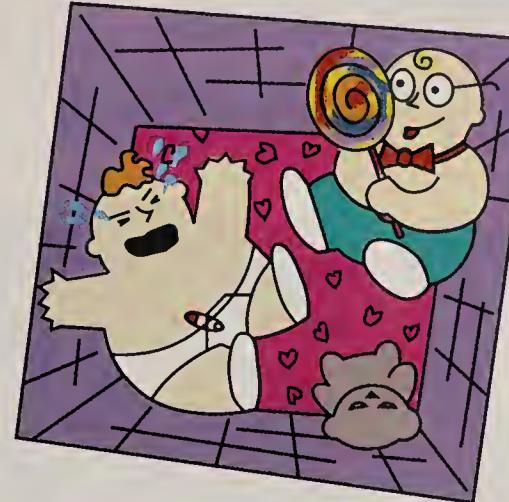
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Stop whining and leave Microsoft alone

John Chisholm



JANELL GENOVESE

unable to win in the marketplace, Microsoft's competitors have taken their case to the federal government. They want the Federal Trade Commission to stop Microsoft.

Microsoft is an easy company for competitors to envy. The firm's profits represent the lion's share of total profits among PC software companies. But the FTC's job is to protect consumers — not competitors — and end users keep voting pro-Microsoft with their pocketbooks.

Monopolistic behavior means withholding or slowing the pace of innovation. That hardly describes Microsoft, which at Comdex Fall '92 alone introduced support for workgroups, video and two new databases.

Although competitors resent Microsoft's hardball tactics in negotiations, virtually every software company in the world would like an alliance with them. Ironically, many of the firms most critical of Microsoft owe their existence to the large, homogeneous market that MS-DOS created.

Specifically, WordPerfect, Borland International and others have complained that Microsoft exploits its systems software technology to aid its applications business.

In the 1970s, Berkey Photo sued Kodak for introducing the Instamatic camera and Kodacolor II film cartridge, which initially only Kodak could produce, without predisclosing the technology to film developers such as Berkey. In the 1979 decision favoring Kodak, Judge Irving Kaufman wrote: "If a firm that has en-

gaged in the risks and expenses of R&D were required in all circumstances to share with its rivals the benefits of those endeavors, incentives ... on which the proper functioning of our competitive economy rests ... would very likely be vitiated."

Forcing Microsoft to modify its practices of licensing MS-DOS to OEMs, as the FTC would like, will benefit no one — except perhaps Novell's lethargic Digital Research unit — and will mean higher administrative costs for OEMs. Splitting up Microsoft, as some go further to suggest, would force end users to deal with yet another set of salespeople, support staffs and release schedules.

Microsoft's success is due, in large part, to its consistently long-term view. The firm worked on Windows, which now sells with more than half of all new PCs (over 12 million copies per year), for eight years before it took

off in 1990. Microsoft could have quit investing in Windows long ago, as IBM did with Top View, Digital Research with GEM and Visicorp with Vision, three now-defunct GUIs. Users can be grateful that Microsoft had the vision and persistence not to do so.

However, if you think Windows is a monopoly, don't blink. Software "monopolies" are short-lived. In the mid-1980s, Lotus had a similar franchise with 1-2-3; in the early '80s, it was Visicorp with VisiCalc. If history is a guide, we'll see Windows superceded by a new GUI from a different, perhaps as-yet-unknown, supplier before the year 2000.

Bureaucracy and inefficiencies usually appear as companies grow. If they take over Microsoft, as we have seen happen at IBM, General Motors and elsewhere, Microsoft will lose customers, revenue and market share, as it will deserve to. Until that happens, the company and its customers should not be penalized.

Monopolies that truly hamper progress are not hard to find. They are those with exclusive franchises granted by government: the U.S. Postal Service and the public school system are two examples. Let the FTC turn its attention to them.

Chisholm is president of John Chisholm Co. in Menlo Park, Calif. He consults with computer and software companies in marketing and strategy. Microsoft is not a client.

Biology is destiny in computers, too

OPEN MIND by Esther Dyson

Not long ago, I was waxing eloquent about the future of computing — message filters, personal agents, "knowledge navigators" and the like — to a group of *Computerworld* advertisers and readers, when a questioner (Jacob Stein from Versant Object Technology) brought me up short.

"Won't people be awfully disappointed when they find out this stuff isn't perfect?" he asked. "Won't there be a huge backlash?"

Indeed, all the advertising tells us computers are digital and binary, they don't make mistakes, they're reliable and precise, and they have specs, not personalities. No one talks of a computer as being mostly right, partially accurate or approximately anything. It either is or it isn't. No one considers that such tools need to be programmed or at least trained.

We compare computers with machines, not people. Yet as we expect computers to replace people — librarians, secretaries, traffic managers — we need to apply a different sort of measurement and different expectations.

The computer industry already hit this issue with expert systems, but we never reached a mass market (at least not visibly, as expert sys-

tems), perhaps for this very reason. But mail filters, personal agents and knowledge navigators devices *will* serve mass markets.

We need a new metaphor for computers, one that is closer to biology than to machinery, as we apply them to less mechanistic and more personal tasks. Just as you don't expect perfection from a secretary or a librarian, you should not expect perfection from your agent.

I'm not suggesting anthropomorphism for computers — the mistaken notion that computers are human — but something much more subtle. Yes, computers are machines, and they don't have human feelings. But as we apply them to human tasks, they will reveal human failings — ours or theirs — such as unclear instructions, conflicting priorities and inconsistent responses to similar situations.

In the past, technology changed more slowly and users had time to adjust. People had time to understand the limitations of new technologies such as airplanes and cars: You have to learn to drive, and they can be dangerous.

With computers, there are similar problems. With agents, filters and other personal tools, there will be a new job of defining better what you want. (Imagine giving your car a map beforehand instead of making the turns as you

go; that's something like programming.) You think you know your own preferences until you discover exceptions ... in real time. I always want the cheapest hotel room ... except when I'm planning to have meetings in it all day. I always want to sit by the window ... unless I'm with my boss, who also prefers the window.

Training a personal device is an interactive process. You learn how to use it; it learns how to serve you. The need for training isn't a failing on the part of the manufacturer but rather the need and potential for customization. If you want it to be yours, you have to make it yours. *You're responsible!*

Of course, this issue reflects an even broader problem that computers aggravate: Our tendency to see the whole world as a potentially perfect machine and any problem as someone's fault. We expect things to run smoothly, and we want to blame something or someone if they don't.



Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets, respectively, in Eastern Europe.

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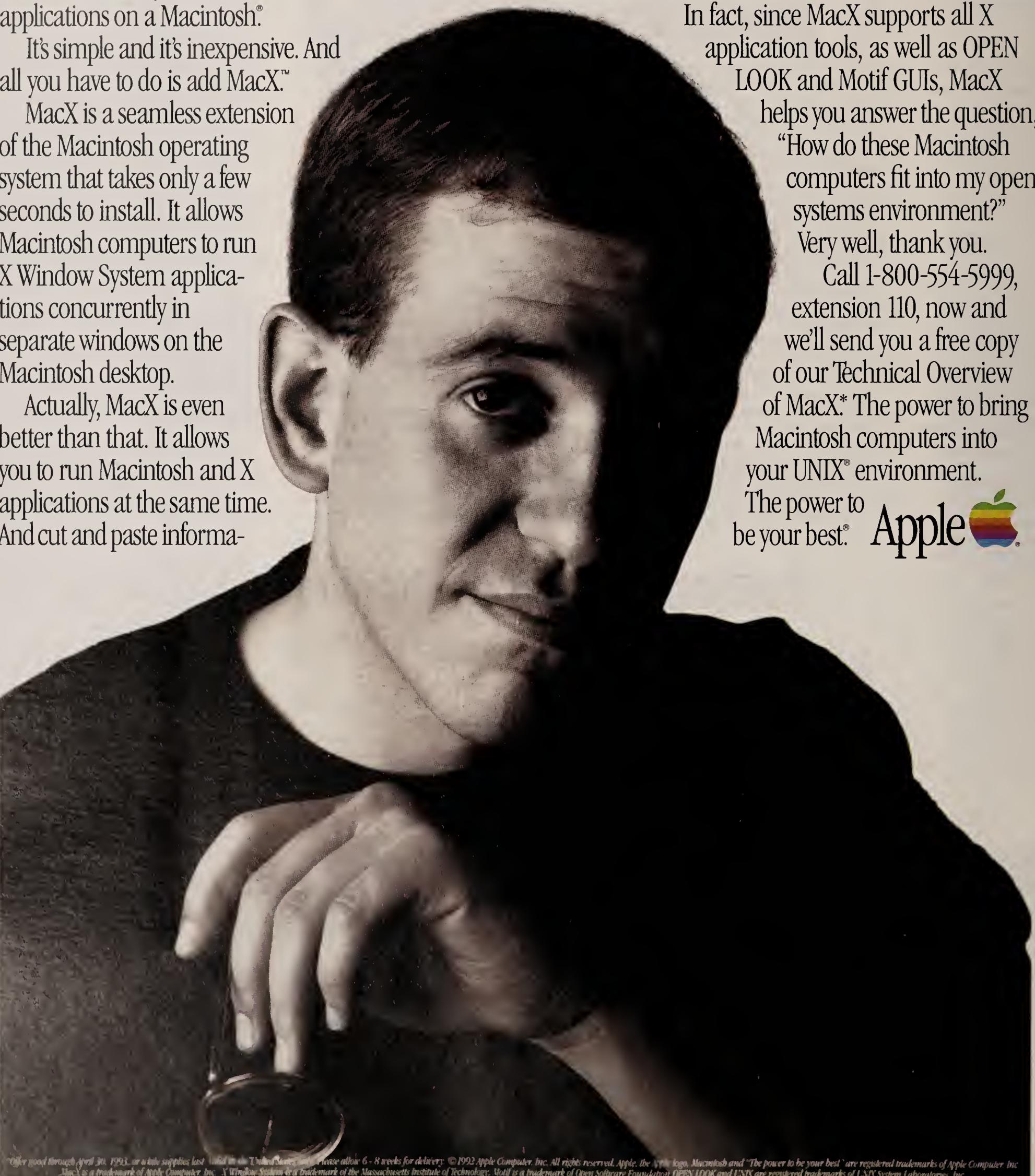
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Commentary

Charles Babcock

A unified reality?



After his company moved to acquire Unix System Laboratories (USL), Novell President Ray Noorda announced it was time to unify Unix.

There is room to question whether unification is a realistic hope or whether it would make a difference, but one shouldn't discount the possibility of surprises here.

Given Noorda's capacity to get industry competitors to work together, a new alignment of forces might emerge to renew Unix's growth.

This is not to say that Noorda, with a wave of his hand, can convert the masses to Unix. Barriers remain even if the Novell/USL deal lives up to its maximum potential. But much of the battle over the next-generation operating system will be fought at the server level above the PC end user. At that level, Novell is scrambling into the ring as a contender.

Possible saviors

There are a number of alignments that could materialize to strengthen Unix's prospects:

- System V might absorb design improvements from the Open Software Foundation's OSF/1.

If the OSF were freed of the burden of developing OSF/1, it could focus on supplying middleware for a distributed computing environment. Novell is a member of OSF and, with a stroke of the pen, can make USL a member as well.

- Unix development might also gain new impetus from Novell's strategic need to fend off the Microsoft Windows NT challenge. Some Unix proponents fear Novell will take control of Unix as a proprietary product, but Novell isn't likely to want to disrupt the "open system" value of its acquisition. At least some Unix licensees will understand the value of Novell as the engine driving Unix.

- Unix variants will remain, but they could achieve a higher degree of compatibility. A "unified" Unix might still have several names and graphical user interfaces, but it would also have common application programming interfaces, common security and common system management.

Roel Pieper, president of USL, says the current Unix versions are "90% to 95% compatible." Competitive marketing has created the impression that they vary widely, but IBM, HP, The Santa Cruz Operation and others will have a compelling reason to drop that pretense if Microsoft starts making headway with Windows NT. Some members of the Unix community even envision a Unix Summit next

spring to support a unified Unix.

Would DEC and Sun Microsystems attend such a party?

DEC probably won't join in.

At this point, DEC appears to be the last true diehard in the OSF, continuing to invest in OSF/1 at face value. For DEC to drop OSF/1 at this point would mean writing off millions of its own development dollars in OSF/1. This isn't likely to happen.

Sun might come around, however.

Sun's style is "to do it all themselves," in the words of Pieper. Sun officials have made noises about how only Sun remains as an open systems company now that Novell owns Unix.

However, Jim Billmaier, Sun's vice president of product marketing, sounded conciliatory when asked about Novell's acquisition. "We expect 95% to 99% of what Novell does with Unix will be the right thing."

Is it possible that, one day, developers

will be able to write an application that runs without modification under Unix from IBM, HP, SCO and Sun? Might there come a time when IS directors can plan client/server systems that make use of commodity hardware but are still easy to cross-connect?

It's hard to say. Clearly, Noorda is ready to take a shot at making these visions real.

Babcock is *Computerworld*'s technical editor.

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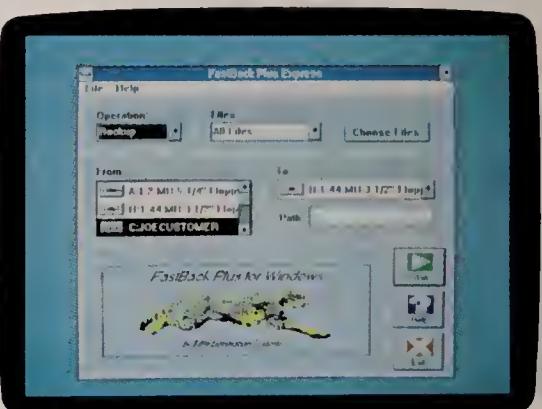
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Desktop Computing

Manual no more: Aetna unit gets PCs, results

New-business process is re-engineered

By Rosemary Cafasso

Just two years ago, the Aetna Health Plan business unit of Aetna Life and Casualty Co. relied on a manual system to process new business. And it had stacks upon stacks of paper to prove it.

So when DeAnn Anderson arrived as director of insurance quality, she found the "case installation" process topping the list of re-engineering candidates.

Today, about 90 users from the marketing and case installation groups work with a PC-based system running a selection of Microsoft Corp. software. In the first full year of use, the team was able to turn around 24% more cases than in 1991 and has not missed any deadlines preparing health plans for new clients, Anderson said.

Long before the productivity boost, however, Aetna set up a team to figure out what the current installation process was and how to fix it. Some concerns emerged immediately, Anderson said.

Inconsistencies abounded
First, the various Aetna regional offices handled the installation process differently, so there was no consistent set of procedures in place.

Second, new case managers were working with almost unmanageable amounts of paper. "Sometimes it would take three 4-inch binders [of documents] for one installation," Anderson said.

These managers were working with little twists and nuances with every potential business client, so each installation was like starting anew. With each case, staffers needed to assemble a work strategy to manage it. That alone could result in a 1-inch thick manual, which had to be updated weekly.

"We looked at this [process] and knew we had to re-engineer it," Anderson said.

Beginning in early 1991, the task

force began examining what was in place by breaking the process into manageable pieces. Then the processes in each piece would be identified and fine-tuned—or torn apart, if necessary. Nine months later, the team had the basic concepts down for the Customer Installation Management Systems.

As the group mapped out the process, "we refined it and streamlined it," Anderson said. In the end, the group determined

there were 800 tasks that any given case could require.

The group then decided it needed three key pieces: a database management system to store and build customer profiles, a project management system to cut back on the paper volume and automate the work flow and a front-end application to help automate the marketing and installation managers' jobs as well as interface to the back-end pieces.

Aetna opted to do an entirely PC-based

system because it wanted it to be flexible and easy to use, said Dianne Cowles, director of national accounts. The group selected the Foxpro DBMS, now owned by Microsoft. It then selected Microsoft Project for Windows as its project management system.

The staff designed the front-end software with Spinnaker Software Corp.'s Spinnaker Plus. This icon-based system requires only pointing and clicking to select items.

Aetna marketing staff members use the front-end piece to select options, or Aetna products, that potential clients want as part of their health plans.

Once they complete this profile, they move it, via electronic mail, to Cowles. She reviews the new business and forwards it to an installation manager who retrieves the E-mail and loads it into the case installation front end, also designed with Spinnaker software. This software is directly tied to the Microsoft project management software.

ON SITE

Aetna Health Plan Hartford, Conn.

Challenge: To revamp a paper-based customer installation system.

Technology: PC-based database and project management along with in-house designed front end.

How suite it is

IS directors find reduced training, other benefits to software

By Michael Vizard

■ As interest in suites of PC application software continues to grow, information systems directors are finding that purchasing these software packages provides a number of substantial benefits beyond simple price savings.

For IS directors, a bundled suite of software such as Microsoft Office from Microsoft Corp. or SmartSuite from Lotus Development Corp. represents an opportunity to standardize their company's PC application software.

This strategy gives IS directors more control over the deployment of diverse PC applications while also serving to reduce training costs because every application in the suite has the same user interface.

For example, Persona Care, Inc. in Baltimore, which manages a large network of nursing homes across the U.S., recently adopted Lotus' \$750 SmartSuite for Windows package. The Lotus offering consists of Lotus' 1-2-3 spread-

sheet, Ami Pro word processor, Freelance Graphics, CC:Mail Single User Pack and, for a limited time, Lotus Organizer, which is a personal information manager.

"It's too hard to keep up with all the different PC applications at multiple sites in terms of providing support," said Scott Preston, director of MIS at Persona Care. "We decided to standardize on SmartSuite running on [Novell, Inc.'s] NetWare because everybody at our sites is a heavy 1-2-3 user."

More standardization

Also moving to standardize its PC application software purchases is Northern States Power Co. in Minneapolis, a regional electric and gas utility for the states in the northern part of the Midwest. The utility has opted to standardize on Microsoft Office. Priced at \$750, Microsoft Office consists of Microsoft Word word processing software, Microsoft's Excel spreadsheet, PowerPoint presentation graphics software

Suites, page 39

Pen computing

Automation to save time for highway inspectors

By Michael Fitzgerald
LANSING, MICH.

While pen computing has developed little more than a bad reputation in the last year, some users have found ways to wipe off the tarnish.

The Michigan Department of Transportation (MDOT), for instance, is on the verge of moving from piloting pen computers to outfitting its highway inspectors with them.

The main thrust of the systems is to make life easier for the MDOT's 300 highway inspectors and to save money. Currently, inspectors file daily reports on progress, material needs and other factors involved in highway construction. In the past, these reports have been reentered by hand. The use of pen computers and standard floppy disks to transfer data should greatly reduce the cost of processing these reports, the agency said.

The pen computers are also expected to relieve pressure on the MDOT's staff. Michigan has the same budget restraints that most states have these days, and the MDOT cannot replace people who leave the staff.

"Our staff has been going down, so this is one

way to save work," said Kevin Fox, senior systems analyst at MDOT.

Fox said the department plans to purchase 275 Grid Convertibles from Grid Systems Corp. in Westlake, Texas. Budget allowing, the purchases will take place in the next two years. For this year, Fox would like to get 150 of the systems, though right now money is budgeted for just 50. Fox said the department estimates that its investment will be paid back in 11 months.

"We'll begin statewide implementation in April, in time for the summer building season," Fox said.



Michigan highway inspectors will use pen computers to file reports from construction sites

highway construction.

8086 in the GridPad, the ability to use a keyboard for special comments on forms and the 3½-in. floppy, which will allow the MDOT to avoid buying costly flash cards for storage and data transfer.

Fox added that the Convertible makes the MDOT's applications, written in Pen Pal, a development tool built by Pen Pal Associates, Inc. in Los Altos, Calif., run much faster. Fox said several other departments in Michigan are watching the rollout to see how it goes, as are highway departments in other states.

HELP LINE



Microsoft Excel

This is another installment in a series of articles containing questions commonly asked by users and responses from software vendors' support lines. This week's focus is on Microsoft Corp.'s Excel spreadsheet.

Q: How can I use Autofill to clear a range?

A: In addition to being able to create a range with Excel's Autofill feature, you can also clear cells by dragging the fill handle back through the selected range. The cells in the range turn gray as you drag the mouse over them and are cleared when you release the mouse.

Q: How can I fill a range with a formula or value?

A: If you would like to have the same formula or value fill a range, first select the range, then enter the formula or value in the first cell and hold down the CTRL key (or the CONTROL key in Microsoft Excel for the Macintosh) while you press ENTER. The formula or value will fill the entire range.

Q: Can I get text to wrap within a cell?

A: Instead of having long strings of text overflow into adjacent cells, you can display the text on multiple lines within the cell with text-wrapping. To select cell text-wrapping, choose Alignment from the Format menu or shortcut menu, select Wrap Text and choose OK. You can also add a line break whenever you have text-wrapping selected. To add a line break in a cell while you are typing in Excel for Windows, hold down the ALT key and press ENTER. In Excel for the Macintosh, hold down the OPTION + COMMAND keys and press ENTER.

Q: Is there an easy way to set column width and/or row height?

A: To quickly adjust column width to accommodate the longest cell entry in a column, double-click the line to the right of the column heading. If more than one column is selected, double-clicking the column heading line for one column adjusts the column widths for all the selected columns.

To quickly adjust row height to accommodate the largest font in the row or to adjust row height for cells containing wrapped text that has been edited, double-click the line below the row heading.

Q: What are some keyboard shortcuts that will help me get my work done quicker?

A: You can change a value or a formula in your worksheet by editing the data in the formula bar. As is shown in the table, using some key combinations with characters in the formula bar will result in a different action than if no characters are selected.

Q: How do I set a new default chart type?

A: You can define a particular chart type to be the default chart type that appears when you choose File New Chart or create an embedded chart on a worksheet.

To define a default chart type, first format an existing chart in the desired chart type. This chart may or may not contain actual data. If the chart contains references to a particular worksheet, these references are changed to the current worksheet when the chart template is used. Place the file in a separate chart window and save the chart as a

template by choosing "Save As" from the File menu. Name the file "CHART" and save it in the start-up directory or folder.

Q: What do I need to do to rotate a three-dimensional chart on the screen?

A: You can use the mouse to rotate your 3-D charts to show any view (including a view from "under" the chart looking upward). To rotate your chart, first double-click to activate a separate chart window. Click one of the corners of a 3-D chart (where the axes

meet), which will cause black squares to appear at the corners. Note that the word "Corners" will appear in the reference area of the Formula bar to alert you that the chart is now in direct manipulation mode. Drag any black square with your mouse to rotate the chart.

To see the chart outlines while you rotate the chart, hold down the CTRL key (or the CONTROL key on the Macintosh) and follow the same procedure. To reset the chart to the original perspective, choose 3-D View from the Format menu and click Default and OK.



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IS finds benefits of software suites

CONTINUED FROM PAGE 37

and a single-user license for Microsoft Mail.

"There's no question we looked at price, but the deciding issue was the savings from training and support, as well as the reduced costs we expect to save from not having to integrate software

ourselves," said Dick Elhardt, administrator of information services at the gas utility.

"The initial price of the software is such a small cost of the overall costs," he added.

According to Elhardt, Northern States

Power previously had a corporate standard for DOS that was not enforced, but with the appointment of Roger Sandeen as the company's chief information officer last year, a standard for Microsoft Windows applications is now being enforced. The decision to have a PC application standard is being driven by the difficulty associated with supporting diverse packages under Windows, Elhardt said.

"There was a lot of resistance to going

with a suite. We had been looking at buying Lotus 1-2-3, WordPerfect and Harvard Graphics, but we weren't too far into deploying Windows when we decided you had to look at the total package rather than individual applications," he said.

However, opting for a suite of applications from one vendor is not without its risks. "Lotus is essentially giving away the software, but the trade-off is that now they have us locked in for the future," Preston noted.

Despite the risks, other large IS organizations are also moving to standardize on suites of PC applications. Microsoft counts Northern Telecom, Inc.; the mid-size car division of General Motors Corp.'s Electronic Data Systems Corp.; and Rugby Darby Corp., a pharmaceutical house, among its large IS accounts.

"There's no question we looked at price, but the deciding issue was the savings from training and support."

—Dick Elhardt

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The company reported Microsoft Office ranks in the Top 10 sellers list for distributors Merisel, Inc. and Ingram Micro, Inc.

"With DOS, it was virtually impossible to integrate applications. But with Windows, we're seeing a tremendous trend to use applications together," said Marilee Anderson, product manager for Windows Office.

In fact, the average number of applications on a Windows platform is now 7.9, while the average number of applications on an Apple Computer, Inc. Macintosh is 7.1, according to Computer Intelligence/Infocorp, a market research firm in Santa Clara, Calif.

However, while Microsoft has had a two-year head start over Lotus in terms of selling an integrated desktop application software package, Lotus counts among its recent successes Primark International, which makes Tupperware, and Fluor Daniels, an engineering construction firm.

The continued success of Microsoft and Lotus with these packages will depend heavily on how well they can attract upper management in IS organizations.

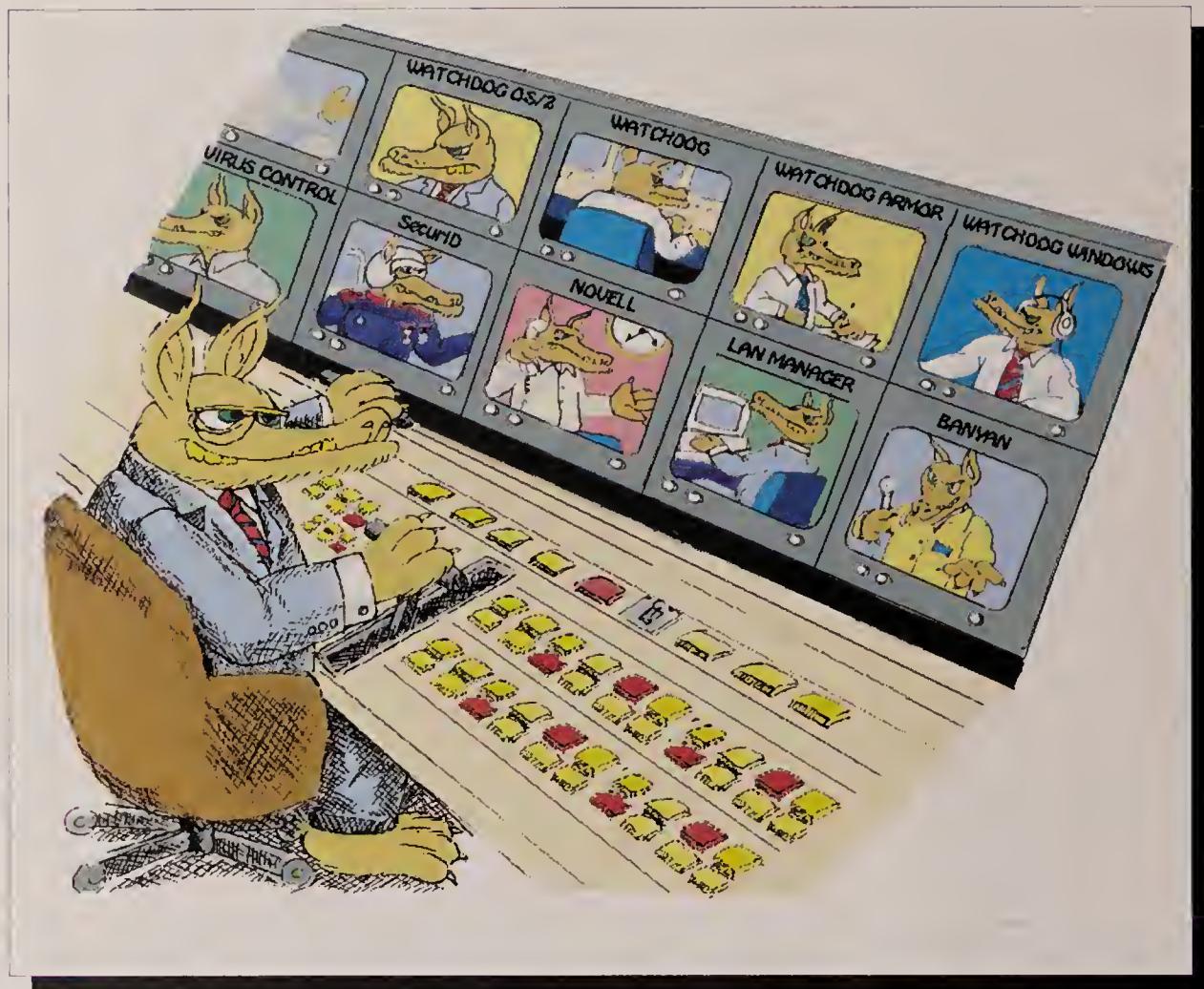
"Packages like these are a big company sell; they're not that attractive to individual end users, who tend to focus on specific packages," said Bill Higgs, vice president of software research at Computer Intelligence. "A company buys a suite to cut more teeth behind the effort to get people not to buy individual packages that will have to be supported," he said.

"PCs and individual applications tend to be purchased out of individual department budgets, while purchase of suites come out of IS budgets," added John Donovan, director of groupware services at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

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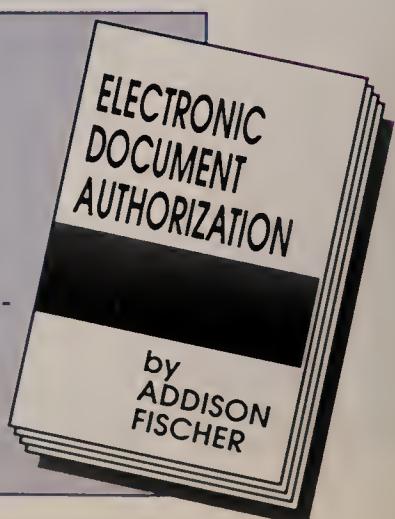
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The One 4GL To Build On

High-tech transition helps fill jobs

By Gary H. Anthes
WASHINGTON, D.C.

■ While President-elect Bill Clinton's picks for a handful of cabinet posts have garnered most of the publicity, behind the scenes a staff of 1,000 volunteers — aided by a gaggle of information systems technology — is working around the clock to fill as many as possible of 4,000 government jobs by inauguration day this Wednesday.

The offices of the Clinton transition team were recently fitted with a Novell, Inc. local-area network spanning four floors, 13 Sun Microsystems, Inc. workstations, 20 PCs, three high-capacity Fujitsu Ltd. optical character

recognition scanners and application-processing software from Resumix, Inc. in Santa Clara, Calif.

The system is processing 2,000 resumes a day, matching them with job openings where possible.

Incoming resumes are scanned and input into a Resumix database in two forms: as an exact image and as searchable ASCII text. The Resumix software also builds a standard candidate profile consisting of job classification, address and telephone information, education, work history, skills and experience.

Resumix uses artificial intelligence techniques to build the applicant skill/experience summary, said Rodger Sellers, project manager at Computer Task Group, Inc. in Buffalo, N.Y., which set up the system. For example, he said, the software can establish a context for a reference to "apple" to decide whether the applicant is a farm worker or a PC specialist.

The system matches resumes with job requisitions loaded into a separate database, and promising matches are flagged for manual review by hiring managers. Key word searches can be used to find people with particular combinations of skills, experience and education.

The system generates acknowledgment letters for every applicant. "That's something that was not done in any of the earlier presidential transition periods," Sellers said. "They didn't have an automated system because the technology wasn't available. So a lot of people just sent their resumes into a black hole."

The system is leased for an undisclosed sum, but Mark Bilsky, personnel systems director for the Clinton transition team, said a comparable system would cost about \$500,000. Since late November, it has processed 100,000 resumes, a process he said would have taken a year by conventional manual means. "The savings are tremendous. We've saved 500,000 pieces of paper so far, and we've eliminated data entry and file clerk positions," he said.



Desktop to mainframe

DEC users await Windows NT

By Melinda-Carol Ballou

Digital Equipment Corp. users with mixed installations of PCs, VAXs and other systems are looking to Microsoft Corp.'s Windows NT as a means of unifying their environments and ultimately acting as potential servers. Although DEC has announced only an Alpha AXP desktop version of Windows NT, internal DEC sources said that work is currently under way for high-end Alpha platforms running as NT servers, including a 10000 mainframe.

While users will be unlikely to bet their businesses on Windows NT in the near term, most major VMS installations are seriously looking at it to determine whether it has the underpinnings to meet their long-term needs.

The growing ubiquity of PC systems at VAX sites (see chart) is at least partly responsible for the high degree of

enthusiasm on the part of DEC's current installed base for the potential of Windows NT running on Alpha AXP systems — a key market for DEC.

Although Alpha systems running Windows NT are not slated to ship until later this year, when Microsoft makes the operating system available, many information systems managers are making plans to bring in the platforms as soon as they can purchase them.

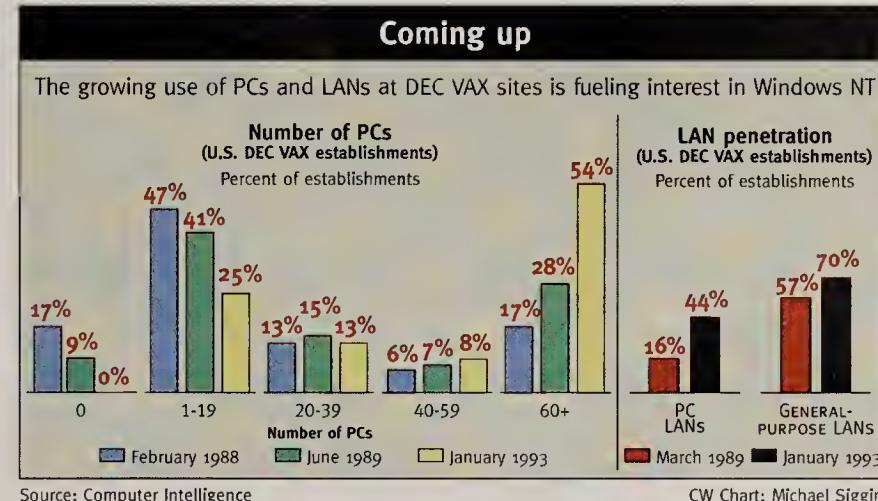
Operating system of the future

Bankers Trust Co. in New York is one such site. It has roughly 10,000 PCs, half running Microsoft's Windows and most of them networked; 300 VAX systems; three IBM Enterprise System/9000 processors and a mix of DECstations and IBM RISC System/6000s, according to Vice President Stanley Rose, who said his organization believes that Windows NT is likely to be the strategic operating system for the next decade.

"NT seems to hold the promise of providing the kind of capabilities you have on VMS, from the desktop to the data center — multithreaded multiprocessors and a powerful file system," Rose said. "I think NT will be the thing that sells Alpha.... If you have NT running across the environment, you can have one operating system to which everyone programs."

The requirements of a good multitasking operating system that will run DOS is "forcing me to be interested in NT," said Wayne Kesling, an engineer at EG&G Mound Applied Technologies, a contractor for the U.S. Department of Defense.

DEC, page 43



HP maintains RISC lead

By Maryfran Johnson
CARMEL, CALIF.

Revenue for reduced instruction set computing (RISC) systems rose 45% in 1992 to hit the \$17.5 billion mark, according to this month's issue of consultant Andrew Allison's "RISC Management Newsletter."

Hewlett-Packard Co.'s Precision Architecture-RISC systems held the lead position, with 30.8% of the market, although HP did drop from nearly a 35% share in 1991. Second in line is Sun Microsystems, Inc.'s Scalable Processor Architecture, which captured 25.1% of the RISC market in 1992 — down slightly from 26.4% in '91.

The dark horse in the RISC picture was the former Mips Computer Systems, Inc. — bought last year by Silicon Graphics, Inc. and renamed Mips Technologies, Inc. — which overtook IBM's efforts and ended up placing third, with 20% of the market.

Even with the embarrassing collapse of the ACE consortium, Mips-based system revenue "grew strongly and decisively recaptured third place from IBM's Power architecture," Allison noted.

IBM held steady with 12.3% of the market in '92, compared with 12.4% in '91.

"It's beginning to look as though IBM's objective of becoming the Unix workstation and server leader by the end of next year will be quite hard to achieve," Allison observed. "All in all, 1993 has the making of being a very good year for HP."

Overall, RISC microprocessor shipments tripled last year to 4.1 million units — more than half of them Intel Corp. i960s, which got a boost from the HP LaserJet IV printer's use of embedded Intel chips.

Allison called Intel's dominance of the embedded RISC market "an ominous sign for the other high-end RISC chips."

In Brief

Client/server conference

The first UniForum Technology Managers Conference, a two-day meeting on client/server application development, will be held March 15-16 in San Francisco. Executives from American Airlines, Hyatt Hotels Corp. and National Can Co., among others, will discuss their experiences in client/server applications. For more information, contact the Hurwitz Consulting Group in Newton, Mass., at (617) 965-7691.

Wyse aids 'velvet divorce'

Prior to the recent breakup of the country, the former Czechoslovakian government's Ministry of the Interior added a \$350,000 purchase of Wyse Technology, Inc. systems to the \$4.8 million it has spent on Wyse equipment in the past 15 months, company officials said. This latest transaction covers multiuser Unix-based systems that will manage the official split of Czechoslovakia into independent Czech and Slovak countries. The first order included 130 Wyse Unix-based systems and 2,096 terminals.

Commentary

Michael Drips

Easy access via Access



Microsoft's Windows database, Access, offers IS managers a rare combination of capabilities: The product is easy enough to use that a wide range of people can use it to manage their data, yet it has the power and flexibility that IS professionals require.

A multiuser relational database that can work with data from multiple sources, Microsoft Access could set the standard for Windows DBMSs.

Traditional character-oriented databases have been limited to plain text and numbers. Like other new Windows databases, Access databases can include complex data such as full-color pictures or diagrams. As an Object Linking and Embedding server, Access' databases can also contain sound, video or such ob-

jects as Lotus' 1-2-3 spreadsheets or WordPerfect for Windows documents.

Access shares the look and feel of other Microsoft Windows applications, so users will feel right at home. In addition, Access supports such Windows conventions as Dynamic Data Exchange — both as a client and as a server — so developers can create complex applications that integrate information from many Windows applications.

Open to all

Access makes enterprise-wide data available to all. As you'd expect, Access can import and export data from such file formats as Microsoft's Excel, Lotus' 1-2-3, ASCII (fixed length and delimited) and popular database formats such as Microsoft's FoxPro and Borland's dBase and Paradox.

It can also read and write data and indexes directly from dBase III+, dBase IV, Paradox 3.0, Paradox 2.5, Novell's Btrieve, and Microsoft's SQL Server.

This allows diverse users with a variety of DBMSs to work together and share data.

Access is a great tool for building client/server applications. Through Open Database Connectivity (ODBC) technology, Access can manipulate data on Microsoft SQL Server in a client/server environment. In fact, users can even create multitable, updateable joins across data-

base formats, and Access will optimize the query to return data as quickly as possible, even if some of that data is on SQL Server.

At Access' Comdex/Fall '92 launch, Microsoft also displayed connectivity to Oracle databases running on OS/2 and DEC's Rdb using additional ODBC drivers. The company has promised to make these drivers available in the first half of this year.

Of course, unlimited access to data can be problematic for IS managers without a sophisticated security system. Here, again, Access more than fits the bill: Its user-level security scheme allows the database administrator to decide who has permission to read, write or delete each database object. Administrators can assign separate user IDs and passwords to every user.

For all its power, Access is easy to use. The product has clearly benefited from Microsoft's usability laboratory, a facility that allows program designers to watch users interact with their products.

Access makes creating complex queries easy. For example, with the Query By Example screen, users simply "point and click, drag and drop" to design queries and create joins among multiple tables, including SQL tables. In minutes, Access can create complex queries that take an hour or more in competing products.

Microsoft Access also features Wizards that allow users to create complex forms, reports and graphs by answering a few simple questions about format, content and style.

A full menu

Finally, for serious database development, Access offers a full development language and Integrated Development Environment.

Access Basic is a powerful database development language patterned after Microsoft's Visual Basic. This is not the Basic users may remember from their distant past. Access Basic is a modern, block-structured language with explicit variable declaration, support for huge arrays, and familiar programming constructs.

Microsoft Access is a bargain. At a suggested retail price of \$495, Microsoft lowered the bar on traditional pricing (usually \$795 or \$895) to bring database pricing in line with other applications such as word processors and spreadsheets.

Looking at a competitive pricing promotion of \$99 a copy until Jan. 31, companies and individuals alike can certainly afford to evaluate Access.

Drips is a Prairie Village, Kan.-based consultant specializing in Windows computing, client/server and CASE.

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DEC users await Windows NT

CONTINUED FROM PAGE 41

ment of Energy. The Miamisburg, Ohio, firm could end up running Windows NT on either Intel Corp. or Alpha AXP-based systems.

Windows NT will be a modern alternative to VMS.

A series of reasons are driving interest in Windows NT on the part of DEC customers, according to David Solomon, president of Solomon Software Technologies, a Nashua, N.H., consulting firm. While many users are loyal to VMS, Windows NT will be a modern, scalable, 32-bit alternative that offers many "VMSisms under the covers," Solomon said.

"VMS programmers have an advantage coming up to speed on NT since they already know concepts which are new to 16-bit [DOS] developers," he said.

Preserving investments

Because Windows NT will be running on Alpha AXP platforms, users will be able to run VMS now

and ultimately bring in Windows NT, preserving their hardware investment.

Windows NT will offer symmetric multiprocessing, preemptive multitasking and true multithreading support so that users will have the potential for each process on a server to run on separate threads for improved performance, Solomon said.

But users will wait for the system to mature before moving over vital business processes, he said.

According to William Ryan, a project leader at Amoco Corp. in Houston, it is "wait and see," though some users "can't wait" to get Windows NT on current systems and also on Alpha. "We will evaluate it, but until it's released and tested, we don't know where it fits in," he said.

Rose agreed. "This is a make-or-break year. If NT comes out this year with all its capabilities, then it will be a winner. If it comes out and it's buggy, then the door gets pushed open for OS/2, and that will hurt DEC a lot," he said.

SAS gains Unix 'Access'

By Gary H. Anthes

CARY, N.C.

SAS Institute, Inc. recently announced new links from the SAS System to Oracle Corp. and Sybase, Inc. databases. Available now for Sun Microsystems, Inc. workstations running Solaris 1.0, they are the first versions of the company's SAS/Access products for Unix-based databases.

"The most frequently requested new feature from SAS System customers at Unix Expo this year was access to Unix databases," said Marianne Sueiu, database interface marketing manager.

With the new SAS/Access interfaces, users can transparently access Oracle and Sybase databases in Sun environments for ad hoc queries to generate reports, join data from other sources and update data in the database, according to SAS.

The new products support SAS' SQL Procedure Pass-Through Facility, which allows SAS users to connect to a relational database management system, execute queries or other SQL statements and then disconnect from the RDBMS. Queries can be optimized because they are executed by the RDBMS, not by SAS.

A first-year license for the SAS/Access Interface to Sybase or Oracle begins at \$825.

New Product

Workgroup software applications

Rational Data Systems, Inc. is now shipping VoiceOver, a workgroup software package.

The product was designed to add voice annotation capabilities to WordPerfect Corp.'s WordPerfect 5.1 for MS-DOS.

Spoken comments can be recorded and fastened anywhere within a WordPerfect document, with standard WordPerfect communication boxes displaying where the voice annotations have been placed. The boxes show the annotation's author name, length, time of creation and date.

The VoiceOver audio comments do not interrupt a document's formatting, and they can be cut and pasted, according to the company.

A single-user license costs \$129.
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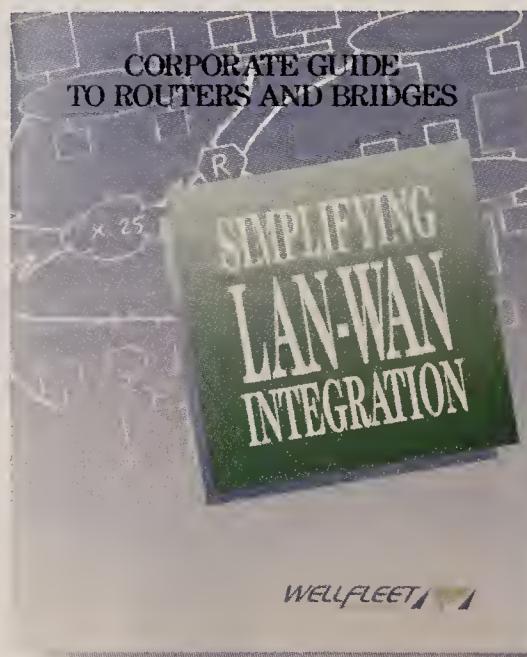


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**When Your Networks Are Complex,
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Integrating Unix mail no piece of cake



Multimedia messaging

For users of the Internet and Unix-based E-mail, a major downfall has been the limitation to text-only messages. Now a new extension to SMTP that runs on TCP/IP will let users send combinations of digitized voice, video, graphics and binary files among networks. Called **Multipurpose Internet Mail Extension (MIME)**, the extension is "critical to enable users with different mail systems across global networks to exchange information," said Andrew Schain, manager of networks at NASA headquarters in Washington, D.C. NASA's "goal is to send multiple attachments of different media without forcing the recipient to break out their decoder ring. MIME is a necessary next step in weaving a feature-rich fabric across E-mail platforms and brings us closer to our goal."

Frontier Technologies Corp. in Mequon, Wis., has announced Super-TCP for Windows, which it claims is the first Windows-based TCP/IP program to implement the new MIME standard.

By Lynda Radosevich

Companies blending Unix-based electronic mail systems into the corporate messaging network realize benefits such as improved communications and reduced training. However, companies are also running into troubles such as lost and jumbled messages, complicated addressing, directory management problems and a lack of delivery reports.

The problem lies in the gateways. Unless a company picks Simple Mail Transport Protocol (SMTP) — the messaging protocol that runs on Transmission Control Protocol/Internet Protocol networks and Unix — as its backbone protocol or uses a public E-mail service provider, it will have to use a gateway to tie Unix users into the corporate system.

"As with all gateways, there are always potential places where things don't operate gracefully," said David Whitten, office information systems program director at Gartner Group, Inc. in Stamford, Conn.

"It's the directory management issues that are eating us alive," said Steve Bradbury, systems analyst at Chevron, Inc.'s information system planning group in San Ramon, Calif. "Gateways don't handle address-mapping situations well."

Chevron uses an X.400 backbone to interconnect 23,000 E-mail users on IBM's Professional Office System (Profs), Digital Equipment Corp.'s All-In-1 and Microsoft Corp.'s Mail, as well as those on Unix mail systems.

To connect the roughly 2,000 Unix mail users to the backbone — provided by Soft-Switch, Inc. in Wayne, Pa. — the oil giant uses Soft-Switch's SMTP-to-X.400 gateways.

"We have to work hard with the Unix gateways. It's a very different messaging environment," Bradbury said. "It's not cohesive. Things you do in one group of boxes may not work for another, and we have 15 Unix workgroups out there."

One of the biggest headaches, Bradbury said, is getting Unix mail addressing to work in a global directory. That is because each Unix workgroup devised its own naming standard with variable conventions and numbers of characters.

Before Unix users can develop a standard method for the gateway to map a Unix mail address to another mail system such as Profs, they have to come up with an internally standard addressing scheme, Bradbury said.

Another addressing problem arises because Unix mail users require different addresses each time they work from a different host, but the gateway allows Bradbury to map only one address to a corresponding address, rather than many addresses to one. He said he would like to see gateways that allow him to map multiple addresses to one.

User solution

To avoid losing messages, Harvard Medical School in Boston built front-end software to its CC:Mail-to-SMTP gateway.

The front end stores incoming Unix mail messages in a queue and sends them at intervals to the CC:Mail gateway. If the gateway is not available, the front end keeps the messages

in the queue and tries again.

"Anyone who is serious about using Unix mail will do this," said Jeff Francis, associate director of information services at the medical school. Otherwise, messages that come in when

the processor is busy stand a good chance of getting lost, he said.

For others, trouble lies in the very nature of the Unix mail system. Rosenbluth International, Inc., a travel service company in Philadelphia, is linking users of the

nationwide SMTP-based Internet into a corporate information and reservation system that works across most major E-mail systems on an X.400 backbone.

Joe Ruggiero, project manager in charge of implementing the new system, said that sometimes the messages from the company's clients using Internet get lost in the process because if someone's computer is down along the way, the message stops, he said.

While some of these problems are not unique to Unix mail gateways, users and experts agreed that Unix mail gateways are less developed than those for other, more commercial protocols.

"You can find better integration between PC mail systems and mainframe systems than either with Unix," said Andrew Wolfe, president of Lipa Strategic Technologies in Salem, Mass. One reason is that "the code base is free for the taking. Companies don't see it as a product with which to make a profit or to distinguish themselves."

Vendors offer partial solutions

There are no simple solutions to Unix mail integration problems, analysts said. But vendors are introducing answers for specific problems, ranging from front ends that address user interface problems to SMTP gateways that solve specific system problems.

Novell, Inc. introduced support for Unix mail with an SMTP module that integrates Unix mail with Novell's Message Handling Service (MHS) protocol. The module addresses one user complaint by supporting messages with attached data files.

WordPerfect Corp. said it plans to introduce an enhanced Unix gateway for WordPerfect Office near the second quarter. The gateway will allow Office users to exchange mail with SMTP users using an "alias," or shortened addressing scheme, the firm said.

Wingra Technologies in Madison, Wis., said it will ship next month a software E-mail switch designed for DEC VAXcluster installations. The switch will convert multiple mainframe, PC and Unix-based mail protocols and provide directory management across the gateways, the company said.

Uniplex Integration Systems, Inc. announced Uniplex Mail, a product that functions across mixed Unix machines, workstations and character and X terminals. It connects to DOS and other platforms through an SMTP-to-X.400 gateway — *Lynda Radosevich*

Wireless networking

Exchange to save \$200,000 annually

By Joanie M. Wexler
NEW YORK

Thanks to wireless networking, the Commodity Exchange, Inc. (ComEx) has expanded the number of goods it trades without adding staff and is saving about \$200,000 a year in data entry clerk salaries, according to ComEx information systems officials.

Handheld, touch-screen computers communicating commodity price changes over a spread-spectrum local-area network are eliminating a couple of costly time-consuming steps in the reporting process, said Arthur Markowitz, senior vice president of operations and systems.

The abbreviated procedure also gives CRT-watching customers



Arthur Markowitz says wireless networking will free up staffers

faster market information as they buy and sell gold, silver, other metals and European options, he said. Changed prices are now reported in one or two seconds, down from

Exchange, page 46

Exchange saves

CONTINUED FROM PAGE 45

three to five seconds, Markowitz said.

In addition, the exchange is in the prototype stage of testing an infrared-based wireless brokerage network of terminals custom-made by Texas Instruments, Inc. in Dallas for the quicker execution of trades, Markowitz said. He said he ex-

pects the evaluation of that network to last four to five months.

"These new wireless technologies should let us use our staff in many more markets without hiring additional people," explained Jack Sabo, vice president of application systems. "We've already expanded the number of commodities we trade to include palladium and platinum without increasing our staff."

The exchange recently equipped 16 trading floor staffers, called price report-

ers, with handheld devices from Granite Communications, Inc. in Amherst, N.H.

The 19-oz. device — called the Videopad VP5 — communicates via radio waves at 122K bit/sec. to a ceiling-mounted antenna, which passes data to a wired PC server at 56K bit/sec., Sabo said.

He said he expects the number of Granite devices to jump to nearly 50 within the next six to 12 months.

The initial investment in Granite hardware and communications network was

about \$15,000, Markowitz said. In addition, the exchange developed the software system in-house in three months for about \$35,000, he added.

When a buy or sell results in a change in price for that commodity, the Commodities Future Trading Commission requires the exchange to broadcast the price to the market on a "timely" basis, Markowitz explained.

Previously, price reporters would listen for a price change and use hand signals to alert a trading floor supervisor, who would call the price change through a headset to a data entry operator off the trading floor.

The operator would then enter the price into ComEx's price reporting system — a fault-tolerant IBM System/88 — that would transfer the information across a high-speed ticker network to wall boards, CRTs and securities quote services such as Reuters Holdings PLC and Quotron Systems, Inc.

Now, the wired PC server communicates directly with the System/88 across an X.25 link.

Besides being faster, "this frees trading floor supervisors from being involved in price reporting so they can focus on ensuring orderly trades," Markowitz said.

Extensive search

Markowitz noted that ComEx had been looking into handheld computers since 1988 to record executed trades. "We've dealt with every handheld company known to man," he said, "but their devices were all too heavy." Many also had battery life limitations or lacked an accompanying LAN, he said.

"There are very few firms with multi-terminal wireless communications," Markowitz said.

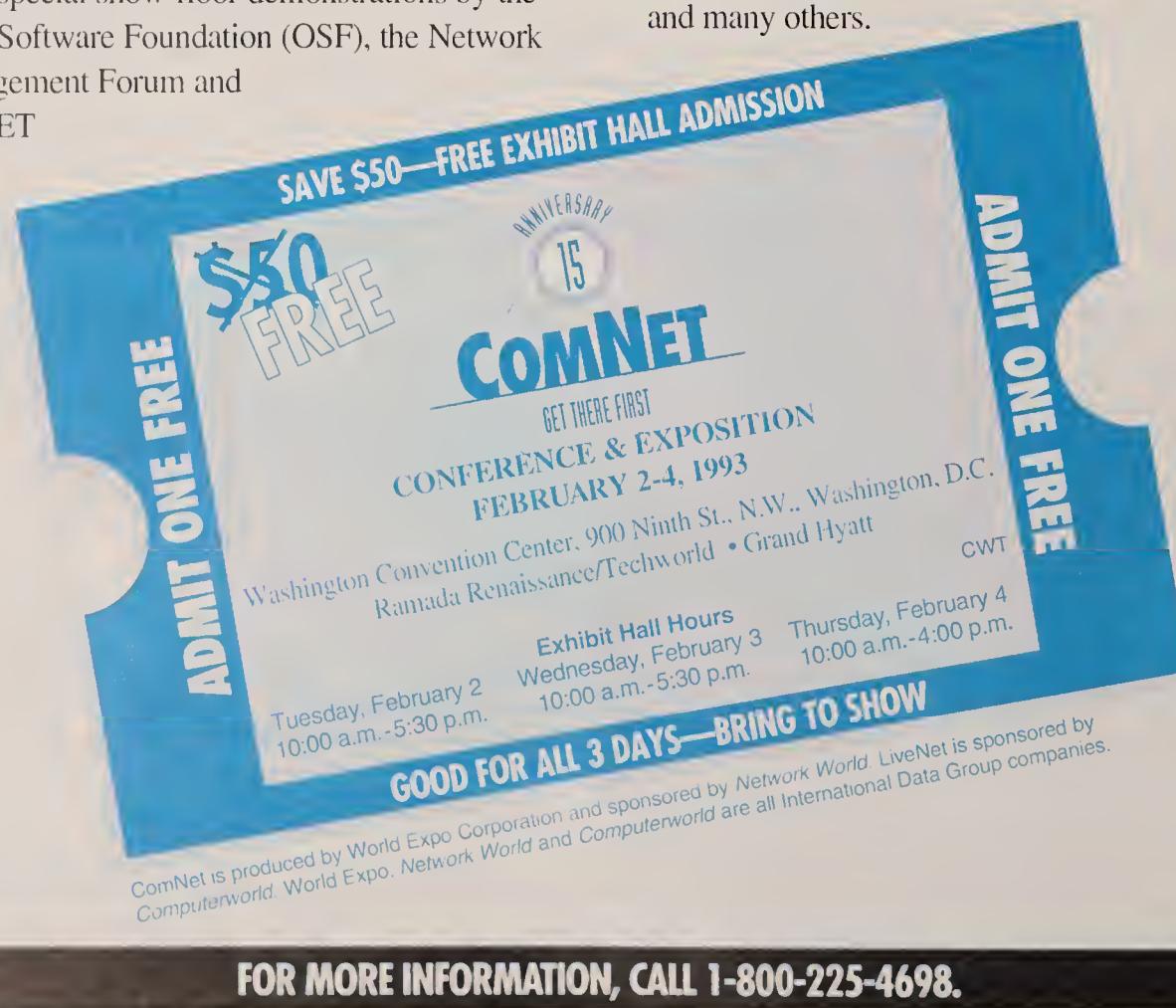
With the Granite network already paying dividends, Markowitz said, ComEx is immersed in the T1 network project. The 21-oz. terminals allow all three input methods: touch screen, keyboard and stylus.

The terminals automatically timestamp a transaction and pass data directly to ComEx's IBM 9121-190 trade processing system.

Currently, brokers write out trades on a card, which they give to a data entry clerk, who enters the information into the 9121 from a direct-attached terminal. The exchange is leaning toward an infrared network, Markowitz said, largely for security reasons: Because of infrared's line-of-sight limitation, trades cannot be conducted outside of the trading pit.

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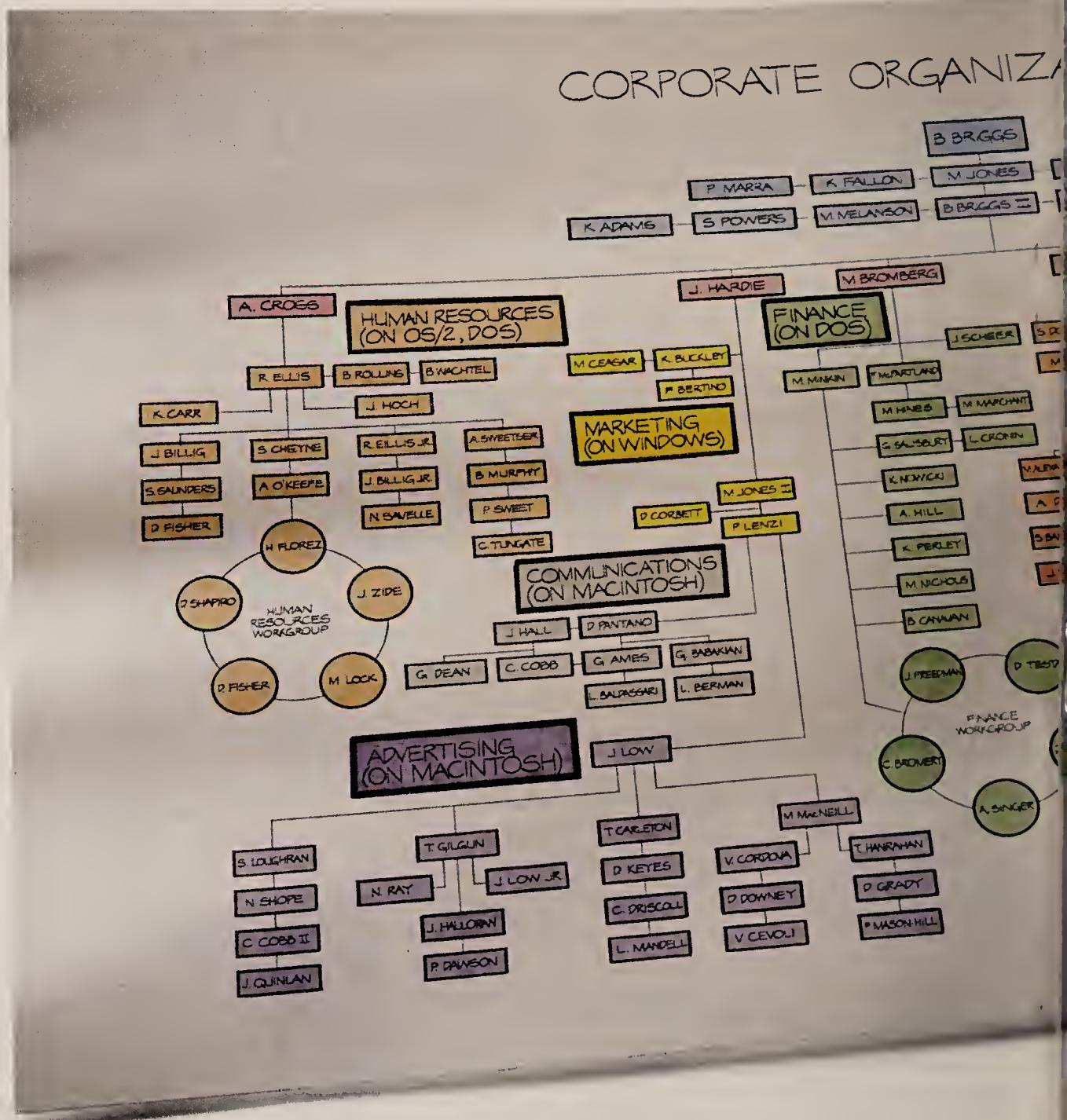
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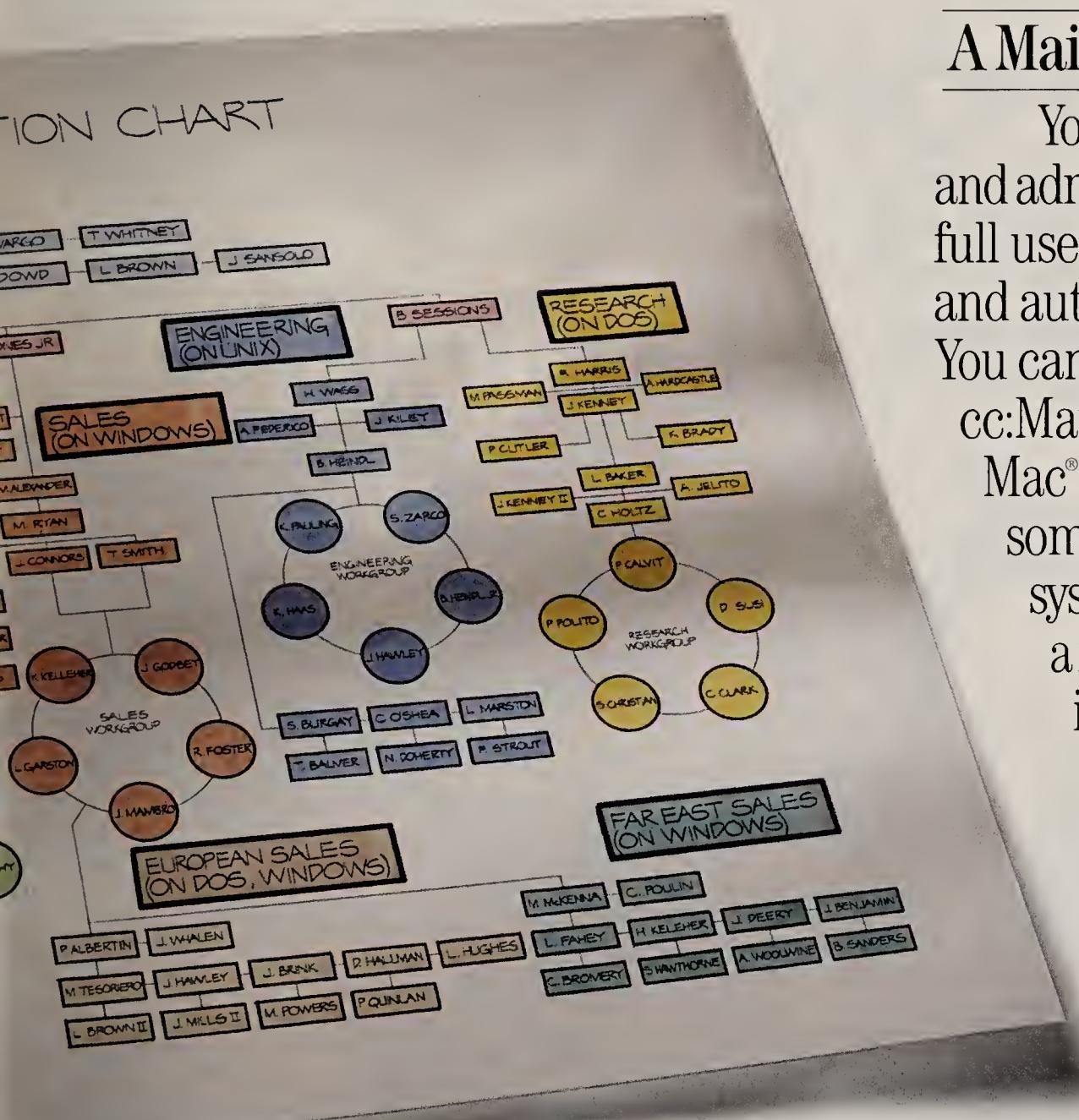
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Net management set for burst of growth

By Elisabeth Horwitt

MOUNTAIN VIEW, CALIF.

Having spent the last few years implementing enterprise-wide, multivendor LAN-to-WAN backbones, companies are now looking for ways to ensure that their

information lifeblood flows reliably and cost-effectively over these links.

As a result, the network management market is expected to enjoy a hefty 25% compound annual growth rate during the next five years, according to a recently released report from Market

Intelligence.

Network management software, services, systems and hubbing will quadruple from \$3.9 billion in 1992 to \$15.8 billion by 1998.

Outsourcing is by far the fastest growing market segment.

Because many companies' installations are a combination of local- and wide-area networks and different vendors' products and services, they will tend to farm out different aspects of their network management needs to more than one vendor, rather than do one-source shopping, according to Market Intelligence.

Users will also demand shorter and more flexible outsourcing arrangements.

In addition, users will weigh reliability over price in their purchase of network management systems, Market Intelligence said.

Another fertile growth area will be artificial intelligence-based products that enable less technical users to operate network management systems.

The network management market's growth will start decelerating toward the end of the decade with the widespread implementation of network management standards, according to the report.

New Product

Micro-to-host

Network Software Associates, Inc. has announced five new software products.

Elite/400 for Windows emulates IBM's 5250 line of terminals and printers, giving PCs access to IBM Application System/400 applications and databases. AS/400 and multiple sessions are supported, and the software builds on the capabilities of IBM's PCS/400 software facility, the company reported.

For users who do not need PCS/400 features, there is the Elite/400DSP for Windows. And the Elite/400 LAN Gateway permits multiple PCs to share a single link to AS/400 client/server applications.

The HLLAPI Toolkit for Windows is an optional software development package that uses IBM's High-Level Language Application Programming Interface and Microsoft Corp.'s Visual Basic to create Windows interfaces to AS/400 applications. The APPC Toolkit for Windows is a similar development package that works with IBM's Advanced Program-to-Program Communications API for Windows.

Prices start at \$295.

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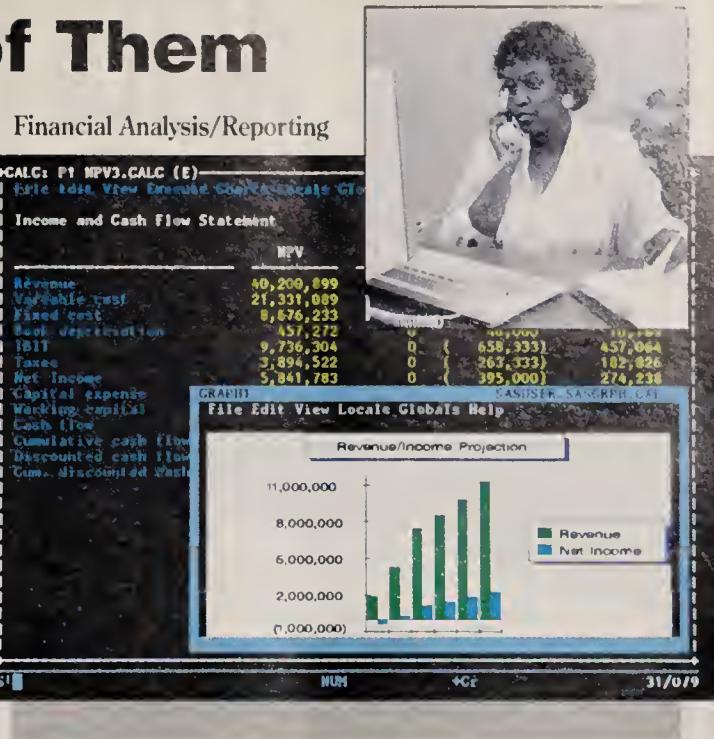
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Vol. I

Focus Breaks Chains of Proprietary SQLs



Relational database users and their applications can be free from the constraints of proprietary SQL dialects through a 4GL that has

Focus Toolset At Home On Rightsizing Turf.

BY MICHELE HUGHES

LOS ANGELES, CA — Rightsizing pioneers are finding a familiar friendly face on the application development scene. FOCUS for UNIX provides the world's

most widely used 4GL for decision support application development and end user computing. The FOCUS Report Writer is widely regarded as the most powerful data transformation tool available for relational and non-relational sources.



IBI Eludes Closed System Constraints.

BY MARVIN HOWARD

NEW YORK, NY — Open Enterprise Information Systems are now a reality through a unique set of data access and interoperability products from Information Builders, Inc. FOCUS for UNIX users can access corporate host data, while UNIX systems do double duty as powerful desktop server platforms for desktop PC users. Bi-directional client/server capabilities allow users of PC/FOCUS and other desktop tools to access UNIX-based data or be routed directly to the corporate host.

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Database performance

Helene Curtis pushes DB2 envelope

By Jean S. Bozman
CHICAGO

Quality code and high levels of database performance are design targets at Helene Curtis, Inc., as the personal care products firm puts IBM's DB2 through its paces.

Lately, database designers at the firm have been trying to squeeze out better mainframe performance by stress-testing SQL statements even as they are being written.

While DB2 is widely used, most of the estimated 7,000 sites monitor the cost of lengthy queries against large DB2 databases that run to millions of rows. Users must find ways to submit efficient query "plans" for execution by the DB2 database system or pay the costs of slowed response time.

At Helene Curtis, response time is a key consideration. One new pricing application will allow prod-

uct-line managers to access DB2 directly through IBM 3270 terminal emulation. Response time is made even more critical by the fact that the 3,100-person, \$1.02 billion firm wants to stay lean and mean in its competitive battles against large rivals: \$29 billion Procter & Gamble Co., the Lever Brothers subsidiary of \$40 billion Unilever Group and \$7 billion Colgate-Palmolive Co.

Accordingly, Helene Curtis' DB2 application development process is intended to disclose hidden costs caused by improper use of system resources by database queries. Last year, database designers in the company's Business Information Services group began pairing Candle Corp.'s DB/Explain product for SQL analysis with Candle's Omegamon II for DB2 performance monitor.

The result, said database administrator Cindy Emig, has

been more accurate code that uses DB2 more efficiently. Developers can identify performance problems before a new DB2 application ever runs on an IBM-compatible mainframe. "We can capture the DB2 transactions, break them down and take a look at how the system is performing over time," Emig said. She noted that the company plans to link the Candle tools directly in 1993.

Price test

Bill Kellow, a senior technical specialist, is leading an information systems team in testing a companywide pricing application. The mission-critical application, which has been in development for a year, will be tested against a working model of the production DB2 database.

When the application goes online this spring, it will invoke many thousands of database transactions per day. Sometime this month, end users will try out the application to make sure it meets Helene Curtis' business requirements.

"The pricing strategy is being changed to provide greater flexibility for our merchandisers and

Helene Curtis, page 54

ON SITE

Helene Curtis
Chicago

Challenge: To improve performance of IBM DB2-based databases.

Strategy: Identify demands on system resources at the application development stage.

Results: More accurate and efficient code.



Eye on SQL

Helene Curtis is using Candle's DB/Explain utility to highlight inefficient DB2 database queries. DB/Explain suggests modified SQL statements for better response times. Candle's Omegamon II for DB2 performance monitor identifies problem SQL statements and passes them to DB/Explain for further analysis. An enhanced DB/Explain package is priced from \$24,000 to \$42,000. Candle's enhanced Omegamon II for DB2, also shipped in December, is priced from \$37,000 to \$65,000.

Chase approves MetroLAN

By Thomas Hoffman
NEW YORK

If all goes according to plan, the 1 million customers of The Chase Manhattan Bank NA will be able to walk into any branch and know that they will receive the same services available at other branches. That is the goal of an estimated \$85 million multiyear project under which the bank will develop a common computing environment for its 350 retail branches in New York, Connecticut and Maryland.

The lead contractor on the project — dubbed "MetroLAN" — will be Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing unit [CW, Oct. 26]. The four-year deal supersedes an existing five-year pact between Chase and ISSC for Chase's Connecticut subsidiary. Roughly \$70 million of the estimated \$85 million MetroLAN funding will reportedly go to ISSC.

The project was designed to provide Chase's regional branches with a common computing architecture so that customers can receive identical services regardless

MetroLAN, page 54

Cincom wins defense contract

By Gary H. Anthes
WASHINGTON, D.C.

Software vendor Cincom Systems, Inc. in Cincinnati won a five-year, \$10 million contract from the Defense Information Systems Agency (DISA) and the Defense Commercial Communications Office to provide relational database management system (RDBMS) and software development products.

Although use of the Cincom products will not be mandatory at U.S. Department of Defense agencies, the DISA contract puts the Cincom products in a "preferred" position, according to Rex Porter, director of Cincom's government systems group.

As part of the Pentagon's Corporate Information Management program, DISA was recently given centralized responsibility for many information systems purchases previously handled by the individual military services.

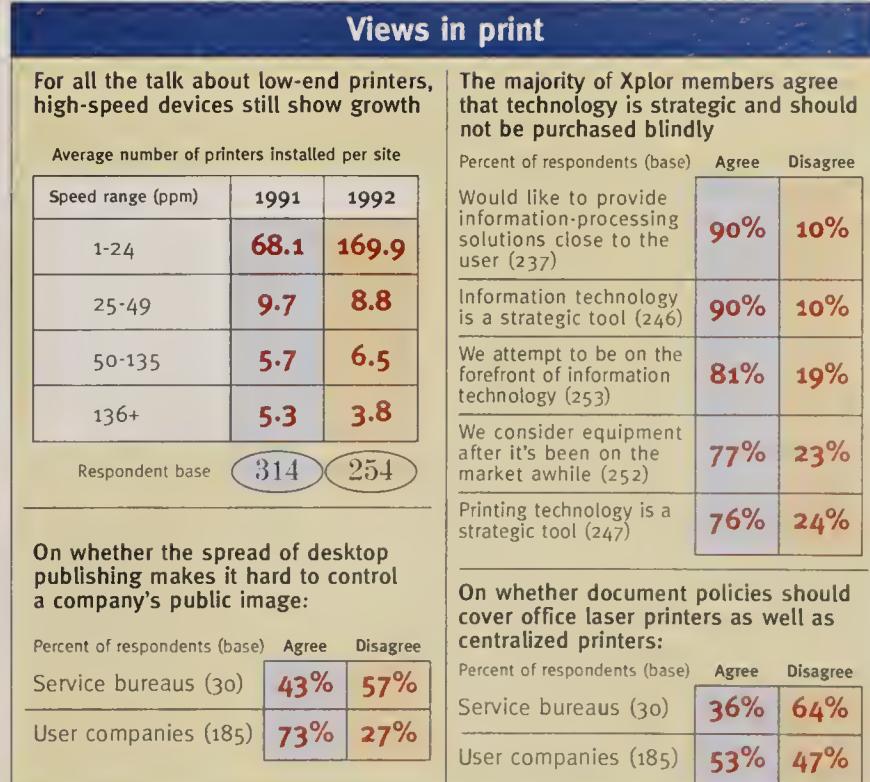
However, a Defense Department contracting official said the acquisition in question began

in 1988 — long before DISA was given the expanded role — and the selection of the Cincom products did not signal an intent to make them the Pentagon's technologies of choice. "Of course, that doesn't keep Cincom from hoping," the official said.

Code serves various platforms

One of the key products involved, Cincom's Supra Server RDBMS, runs on most major platforms such as mainframes running IBM MVS, VM and VSE; Unix- and Digital Equipment Corp. VMS-based midrange computers and servers; and PCs running OS/2 and DOS. Portability and compatibility are ensured because the Supra Server code is almost identical regardless of where it runs, Porter said.

AD/Advantage, Cincom's application development environment, comprises computer-aided software engineering tools that generate and maintain design specifications, SQL statements and other components. It includes Mantis, a fourth-generation language geared for interactive transaction-processing applications.



Source: Xplor International

CW Chart: Michael Siggins

Due to a printing error in the Jan. 11 issue, the above chart is being reprinted.

Chase approves MetroLAN

CONTINUED FROM PAGE 53

of location, according to Michael A. Levine, a Chase vice president.

Chase's regional branches had been architected and run as "separate entities" prior to the MetroLAN project. "Now, we're looking at seamless integration for our own personnel and for our customers," said Philip M. Giaquinto, senior vice president of retail bank operations and systems.

Giaquinto declined to provide cost-savings estimates, but he said the bank should realize "significant savings in back-office operations and technical efficiencies."

Layoffs possible

Giaquinto would not comment directly on likely staff reductions resulting from the project. "But clearly, if you're going from a multiple-systems infrastructure to support those branches as they exist today to a single integrated multibank, multigeography system, you should be

Helene Curtis

CONTINUED FROM PAGE 53

our product-line managers," Kellow said.

A team of four, which includes specialists in IBM's CICS transaction monitor, the DB2 database and application development, is testing the efficiency of each line of DB2 query code. "We have been looking at every SQL statement," Kellow said. That kind of "SQL walk-through" statement-by-statement review is new to Helene Curtis, he said. Queries that make improper use of DB2's built-in optimizer are being rewritten, he said. The evaluation will also review the new program's impact on existing applications.

Extensive up-front analysis has probably extended the time required to develop the new pricing application, Kellow acknowledged. But he said the results are expected to be worthwhile: "Our objective is to have code that's a lot cleaner when it goes into testing."

Teresa Miao, another database administrator, said the new development approach is finding performance hang-ups early on. When design targets for performance are not met, default settings cause green numbers on a display console to turn yellow or red. "You can play 'what-if' games," Miao said. "The monitor shows you how the DB2 optimizer selects the access path based on a [particular] SQL statement, and it shows you when the response time is very good."

Helene Curtis has been using DB2 databases for nearly five years to store order entry information. It now has seven DB2 development environments and several DB2 Version 2.3 production databases. All new applications are being written for DB2 rather than for older, hierarchical IBM databases such as IMS, Miao said.

Banking Applications software. ISSC will provide roughly 250 technicians to assist the same number of Chase technicians in replacing existing software with the Hogan package.

Sources said ISSC had bid to manage the MetroLAN project, but Chase decided against farming out these operations. "We've outsourced back-office systems in Arizona and in Connecticut, but we tend to rely on outsourcing only when it meets a specific need," Giaquinto said.

During the past year, Chase has rolled out MetroLAN in a pilot program to 30 regional branches in downstate New York. To launch MetroLAN, Chase is eyeing 10 branches in Long Island, Brooklyn, the Bronx and Westchester County in which to install the common computing platform.

In fact, Giaquinto said Chase converted the first portfolio of consumer loans to the Hogan package before the ink on the ISSC contract had dried.

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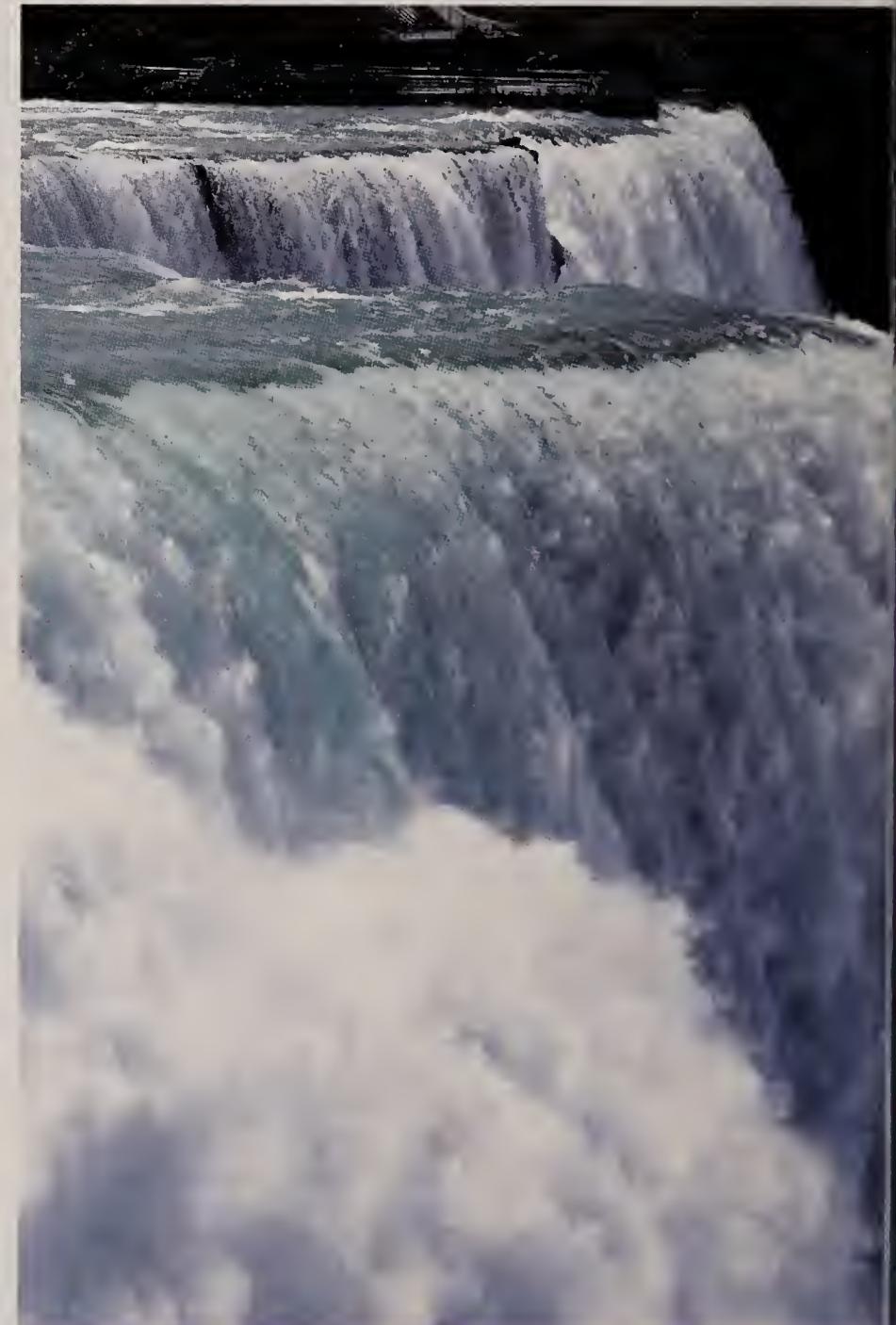
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New Products

System software

TGV, Inc. has introduced MultiNet Services for NetWare Users.

The software product was designed to permit Novell, Inc. NetWare users to access software and hardware resources on Digital Equipment Corp.'s VAX and Al-

pha AXP hardware systems, specifically OpenVMS file and print services, the company reported. MultiNet Services for NetWare Users does not require use of Transmission Control Protocol/Internet Protocol or other alternate protocols because it runs over the SPX/IPX stack. Additional software is not needed for NetWare users to gain access to OpenVMS resources because all software is occupied on the OpenVMS server. A shareable library is also included.

Pricing begins at \$1,000.

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Software application packages

FileTek, Inc. has released Alternative to Microfiche/Microfilm On-line (AMMO-II), a mainframe software package.

Without any application development

or file modification, the product enables FileTek's optical disc-based Storage Machine (SM/2) to be used immediately for microfiche replacement. According to the company, AMMO-II is a menu-driven system that manages the indexing, printing, viewing and transferring of report data on both the SM/2 and the host direct-access storage devices.

Pricing for AMMO-II ranges from \$40,000 to \$60,000.

► **FileTek**
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Rockville, Md. 20852
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WorksRight Software, Inc. has introduced Project Manager, a software system designed for IBM's Application System/400 and System 36.

Users can create simple project schedules with Project Manager. A name and description are established, and an action description is formed, graphically displaying the information, the company reported. The number of projects that can be scheduled is unlimited, and project schedules can be displayed on the screen or printed.

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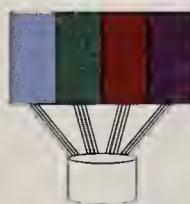
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BlueLine Software, Inc. has introduced Vital Signs for VM/ESA.

The product is an analytical tool and VM performance monitor that was designed to help users manage user and system productivity, the company reported.

Support is provided for both VM/XA and VM/ESA environments. SeekMiser, a component created to optimize direct-access storage device (DASD) access and performance, has been included in the product. Seek activity for VM and VSE files is collected and reported by SeekMiser, which also identifies underutilized DASD space.

A permanent license ranges from \$360 to \$540 per month.

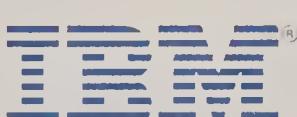
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Turnkey systems

Kinetic Systems Corp. has introduced Captureplus Data Acquisition System.

According to the company, the product is a complete, flexible package designed to capture and analyze transient events. Captureplus is a turnkey solution that is modular and expandable. For easy configuration, windows and icons are provided. Captureplus features include a nonprogramming environment, 12- or 16-bit resolution, Digital Equipment Corp. VAX/VMS compatibility and high data throughput.

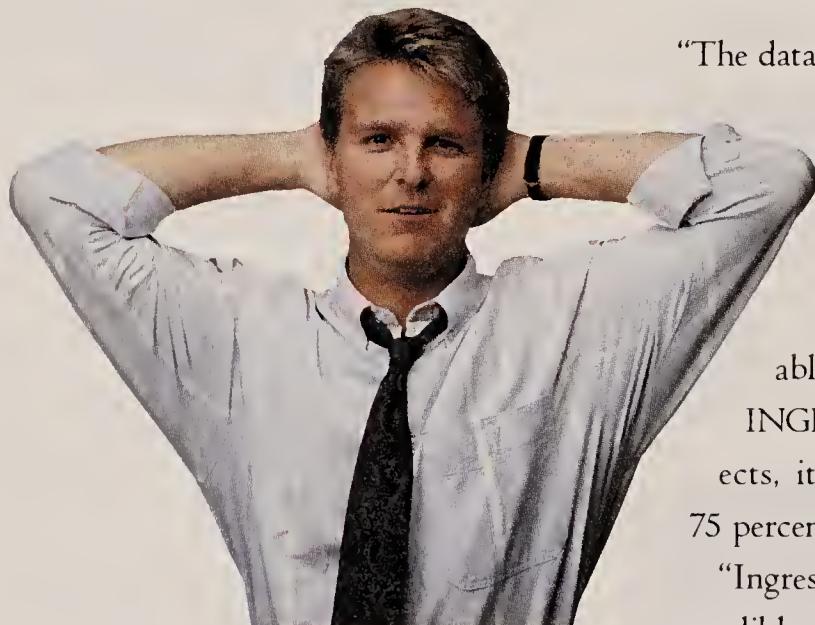
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Anders Nicolausson, National Systems Manager, Construction Market Data, Inc., 250 employees in 15 U.S. offices.

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User Voices

The hunt for good tools

Question: Do you believe that vendors have delivered the development tools needed for distributed computing and downsizing?



Dave Tovrea, information systems technical consultant at Snohomish County Public Utility District No. 1 in Everett, Wash.

As the programming environment becomes more sophisticated, there's a technological lag. Vendors who have only been doing incremental upgrades over the years have been caught by improvements in hardware technology. Things that were impossible to run five or six years ago can now be run easily. Even companies like Microsoft have been writing two separate applications.

What you're really looking at is the difference in the way that vendors have been looking at the programming problems: There are vendors that have been trying to work with current hardware, and those that are dealing one level up with application development environments. Those latter vendors will come out a bit better.

We have Macintoshes, Intergraph workstations and PCs, and we wanted a single programming environment for them all. At the same time, we made a

conscious decision not to become a C shop, and we were not happy with Cobol. We did a pilot, and we were shooting for portability. We chose Smalltalk.

The biggest problem is: How do you distribute and synchronize software releases in a client/server environment? How do you get them out there? Unless you get into local file servers, distribution becomes fairly difficult. We're trying to work with some Digital products for repository and code management, but they're not oriented toward distribution issues.

Larry Cousino, director of MIS at Justin Boot Co. in Fort Worth, Texas.

It's getting better. Certain areas are still slow, such as distributing data among mainframes, LANs and WANs. But we're beginning to see the light at the end of the tunnel.

I look at it from the standpoint of what is the application: who's going to be impacted by it and if it's in the interest of the overall company. If there are multiple users at multiple locations, it's easier to use the mainframe. The decision is based on the overall scope of the application and how to get the best bang for the buck.

There are some fine tools out there,

and there is good software that is working well in client/server applications. Oracle is getting there. We're using CASE tools on the PC. Some of the mainframe tools are a little bit expensive.



Bob Gordon, project specialist at Coca-Cola Enterprises, Inc. in Atlanta.

Developers are in danger of picking something that looks

easier today but that presents problems down the road. The other alternative is to use advanced tools that don't pay off for at least a year.

So it's all economics. The vendors are doing nothing unless they're pushed into it. That's why people aren't moving fast. They have the mainframe security blanket. Vendors are trying to deliver, but they're not sure what's needed. You can't blame the availability of tools on the vendors.

The biggest thing is to educate the existing work force in using new tools. There's a considerable learning curve. It takes three or four months to evaluate what you need, then an education cycle of three to four months and then a learning curve. So it takes at least a year to deliver good client/server applications.

The problem is that there are so many tools, and people evaluating them have no experience using them. They're trying to evaluate tools based on what they see in a demo, and they don't know for six months if they'll work.

Third-party libraries are getting bet-

ter and better. Windows Software Development Kit replacement tools have just started to firm up. Even so, it takes a dedicated effort to use these tools.

Chris Veale, director of technology for the high-tech practice group at Ernst & Young in San Jose, Calif.

The problem is that all are promising things which, in fact, don't turn out to be true. They should quit fighting each other and do a serious job of getting together on well-defined standards. Even the vaunted SQL is not a standard if you look at it, and if you go further down the list, there are no standards.

The unfortunate thing about application development standards is that no one from the user community is in any of the standards groups. It's developers,

vendors and academia. The vendors want their own standards, and the academics are so far out in the ozone they couldn't see the business reality if it hit them in the face.

There are some tools available, but most tend to be Macintosh and Windows, Windows and Unix, or Macintosh and Unix, or some combination that never covers enough. There's no uniform solution to cover the multitude of environments. If you want to develop for Mac and PCs, there are solutions, but if your task includes downsizing mainframe applications to client/server PC environments, the elegant Macintosh and PC solution may not cover the database piece of it.

Responses compiled by senior editor Garry Ray. Comments have been edited slightly for clarity.



In the "User Voices" column, which will appear at regular intervals in our technical sections, Computerworld shares user opinions solicited at random on computer-related issues.

IntelliCorp turns to object-oriented mart

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

IntelliCorp executives said they weathered a long "winter" that plagued many artificial intelligence firms in the late 1980s and are ready to bask in the sun of the hot object-oriented tools market. But the \$12 million firm may yet catch a chill, industry analysts said, because it must prove it can be profitable on an ongoing basis.

Objects are the key to IntelliCorp's expansion, even though the Pro Kappa design tool retains a built-in AI inference engine. "They're positioned right by addressing some of the fast-growing market segments, like downsizing, with object-oriented tools," said Steve McClure,

a senior consultant for object technology at International Data Corp. in Framingham, Mass. "Now they've got to get some profits."

Recent financial problems have made even loyal IntelliCorp users a bit uneasy. IntelliCorp was very nearly purchased by KnowledgeWare, Inc., until a planned stock swap fell through in late 1991. In October, President K. C. Branscomb left, and Chief Financial Officer Kenneth Haas took her place. Then the firm laid off 20 staff members, leaving a work force of 100.

Meanwhile, stockholders saw little return on their investment. "We're running on sales and on cash," company spokesman Jim Sterne said recently. "We still have \$5 million in the bank and no debt."

IntelliCorp's low-profile days may be over. Haas said he will forge partnerships with large firms, including relational database companies and systems integrators. "I'm a pragmatist when it comes to business," Haas said. "Get the revenues up, the costs down, and conserve cash." A new relationship with computer-aided software engineering (CASE) firm James Martin & Co. will yield an object-oriented upper-CASE tool called Object Management Workbench (OMW) this year, Haas said (see box).

Some industry analysts are high on IntelliCorp's technology, even if they think the company may change through merger or acquisition. "We're going to list them as one of the companies to watch in IntelliCorp, page 60

New arrivals

IntelliCorp plans three product announcements in the coming months:

In mid-1993, it will announce Kappa 3.0, an enhanced version of Pro Kappa 2.1. Kappa 3.0 will transform Unix code into PC-DOS-compatible code for desktop use.

Sometime in the first quarter, the firm plans to ship the new Kappa CommManager module, a distributed object manager that will spread applications to Unix or PC platforms in Transmission Control Protocol/Internet Protocol networks.

An object-oriented CASE tool is also expected in 1993. The new Object Management Workbench was developed in conjunction with James Martin & Co.

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In Brief

Landmark purchase

Template Graphics Software, Inc., a San Diego vendor of graphics software development tools based on the Programmer's Hierarchical Interactive Graphics System, has been sold to **Landmark Ventures, Inc.**, an investment group in Sinsbury, Conn. Template was formerly owned by Liant Software.

4GLs waiting on DEC

Cognos, Inc. and Information Builders, Inc. have announced ports of their respective fourth-generation language (4GL) software to **Digital Equipment Corp.**'s Alpha AXP systems. Cognos' PowerHouse 4GL is available for the Alpha AXP OpenVMS platform and will ship with the Alpha AXP systems. Information Builders' Focus for Alpha AXP/OpenVMS was slated for production in the first quarter of this year. Focus for Al-

pha AXP/OSF/1 is slated for release in the second quarter.

Tools launch Mac attack

American Express Co. subsidiary IDS Financial Services will assist in converting a series of knowledge-based development tools from **Inference Corp.** in El Segundo, Calif., to the Apple Computer, Inc. Macintosh. Besides porting Inference tools to the Macintosh, the agreement is expected to result in new tools.

Intellicorp turns to object-oriented

CONTINUED FROM PAGE 57

1993," said Adrian Bowles, director of the advanced software development group at New Science Associates, Inc. in Westport, Conn. "In the worst case, they'll get bought out by somebody else, but I think the technology will survive."

If products were Intellicorp's only concern, its future would look even brighter, analysts said. At a time when many large companies face the task of re-engineering legacy applications, Intellicorp's Pro Kappa 2.1 C-code generator can be used to link new code with old Cobol code.

"It allowed me to concentrate on knowledge engineering and not on the intricacies of the C language," said Bill Green, a project engineer at TRW Corp.'s Military Electronics and Avionics Department in Ogden, Utah. Green used Pro Kappa on a Sun Microsystems, Inc. workstation to build a network management system for the U.S. Air Force. "You don't worry about all the data structures, and you wind up writing simpler programs."

Cincinnati Bell Information Systems is also pleased with Pro Kappa's integration capability, even though users there would like to link Pro Kappa directly to object-oriented C++ class libraries. "We are moving gradually from an [IBM] MVS and Cobol environment to a Unix environment, and we need to have systems that are fully interoperable," said Doug Brueckner, vice president of new systems development. "We think object-oriented technology will buy us time to market and save us money."

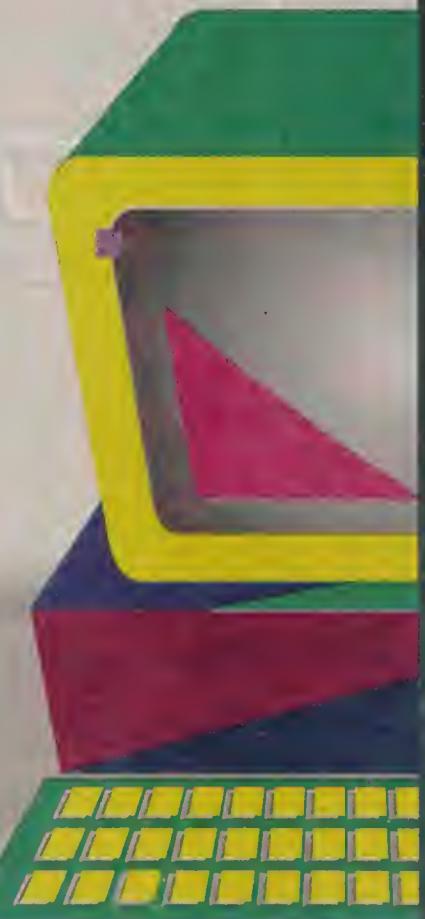
But Brueckner, whose department has been building phone billing systems with Pro Kappa and Sun workstations, has had some concerns about Intellicorp's recent layoffs: "We have a couple of hundred people working with this stuff," he said, "so we've wanted [Intellicorp] to adhere to standards."

Now that they are on a new path, Intellicorp executives are the first to admit that their old AI game plan did not work. Like its former AI competitors, AI Corp. and Aion Corp. — which merged to form Trinzie Corp. — Intellicorp found that AI products have a limited appeal. "Old AI didn't have the performance characteristics people wanted, and it couldn't integrate with existing systems," said Gary Fine, director of Intellicorp product development.

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New Products

Application development tools

NCR Corp. has announced the Natural Interface for Computing Environments (NICE), a Microsoft Corp. Windows-based application development tool.

The product is a software development kit that works with Visual Basic and C languages running under Windows 3.1, the company reported. Mouse, pen input and touch screen can be used with NICE's applications. A library of custom controls is contained in NICE that includes keypads, multifunction buttons, graphic buttons and an edit box.

The product costs \$295.

► *NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Wind River Systems, Inc. has introduced VxSim, a prototyping and simulation tool.

The product was designed for users with embedded software programs. VxSim simulates the target environment on a Sun Microsystems, Inc. workstation when used in conjunction with VxWorks, the company's flagship product. Before hardware becomes available, users can create programs, produce shortened development cycles and allow the design phases for both hardware and software to occur simultaneously rather than consecutively, the company reported.

VxSim prices begin at \$4,995 per user.
► *Wind River Systems*
1010 Atlantic Ave.
Alameda, Calif. 94501
(510) 748-4100

MicroStrategy, Inc. has announced Version 2.0 of EIS Toolkit.

According to the company, Version 2.0 can access more than 50 relational and nonrelational data sources and all major database gateways and create a library of SQL statements. Features include cross-platform support for Microsoft Corp. Windows and the Apple Computer, Inc. Macintosh; support for multiple local data sources; and a spreadsheet engine for signal processing and "what-if" modeling.

Prices start at \$1,295.
► *MicroStrategy*
1 Christina Center
Wilmington, Del. 19801
(302) 427-8800

AdInfinitum Development has introduced ObjX, a development support system for visual database applications.

An interactive, on-line data dictionary is joined with visualization tools within ObjX. According to the company, the product was designed to simplify four-dimensional database development, code-level documentation and maintenance. The hierarchy of procedures and variables that are called by any procedure, script or menu bar are revealed and cal-

culated with ObjX's outliner.

ObjX costs \$395.
► *AdInfinitum Development*
Suite 1R
412 7th Ave.
Brooklyn, N.Y. 11215
(718) 788-7092

Computer Innovations, Inc. has introduced Version 3.2 of Debug 2000, a C/C++ debugger.

According to the company, Debug 2000

provides users with a selection of windows that permit multiple views of the C or C++ program being debugged. As the program executes, the user's choice of windows is dynamically updated. Support for the hardware break points is provided as is full C++ support.

A single-user license costs \$595.
► *Computer Innovations*
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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
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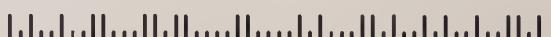
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Management

Yikes! Setting up a GUI can cost 50 times its street price. Even so, IS managers swear the strategic boost is worth it.

Point, click and Pay



JACKSON HILL

Cajun's Don P. Babcock Jr.: 'We haven't needed to upgrade in one fell swoop'

By Michael Fitzgerald
and Carol Hildebrand



ure, it's a pretty face. And for many information systems managers, putting a graphical user interface (GUI) on re-engineered and revitalized systems is a hot priority. But would you get a face-lift without finding out the cost? What if you weren't sure you'd look much better when you got done?

Well, when it comes to Microsoft Corp.'s Windows and IBM's OS/2, many IS shops must hold the strategic benefits very high indeed: They are setting loose thousands and thousands of mice without counting the cost of care and feeding. And that tab can be a surprising chunk of change, according to IS managers and consultants.

"The hard costs [of installing GUIs] you can quantify, but the soft costs go all the way down to business goals," says John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. "They can just mutate into something huge."

A new study by the Microcomputer Managers Association (MMA) and IDG Research Services says training and support costs, on top of required hardware and software, push the average price of moving to a GUI to \$3,960 per unit.

"When we got the survey back and looked at the averages, they blew us away," says George Roukas, director of systems at a Fortune 50 financial services company and author of the new MMA white paper on moving to GUIs. "The actual dollar cost was much, much more than we ever suspected."

Based on MMA/IDG figures, moving to Windows, for example, would cost almost 50 times the software's current \$79 retail price. Even though many organizations don't pay full price, managers say the point is clear: What you get costs a lot more than what you see.

Of course, it's possible to get by more cheaply. A study conducted by WorkGroup Technologies in mid-1992 placed the per-unit cost of moving to Windows at about \$1,425.

The study, however, presumes a configuration of 386SXs with 4M bytes of random-access memory and an IBM Video Graphics Array monitor. Dunkle also says he assumed very inexpensive training costs and did not allow for increased support.

Microsoft officials were wary of assigning an average cost to Windows migration, however. "The problem is, there's no general answer," says Jeff Phiel, a product manager in the Windows group. "It all depends on where you're coming from."

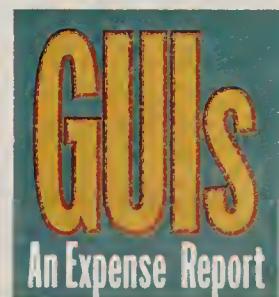
Phiel does acknowledge that training and support costs are likely to go up during initial phases of a migration.

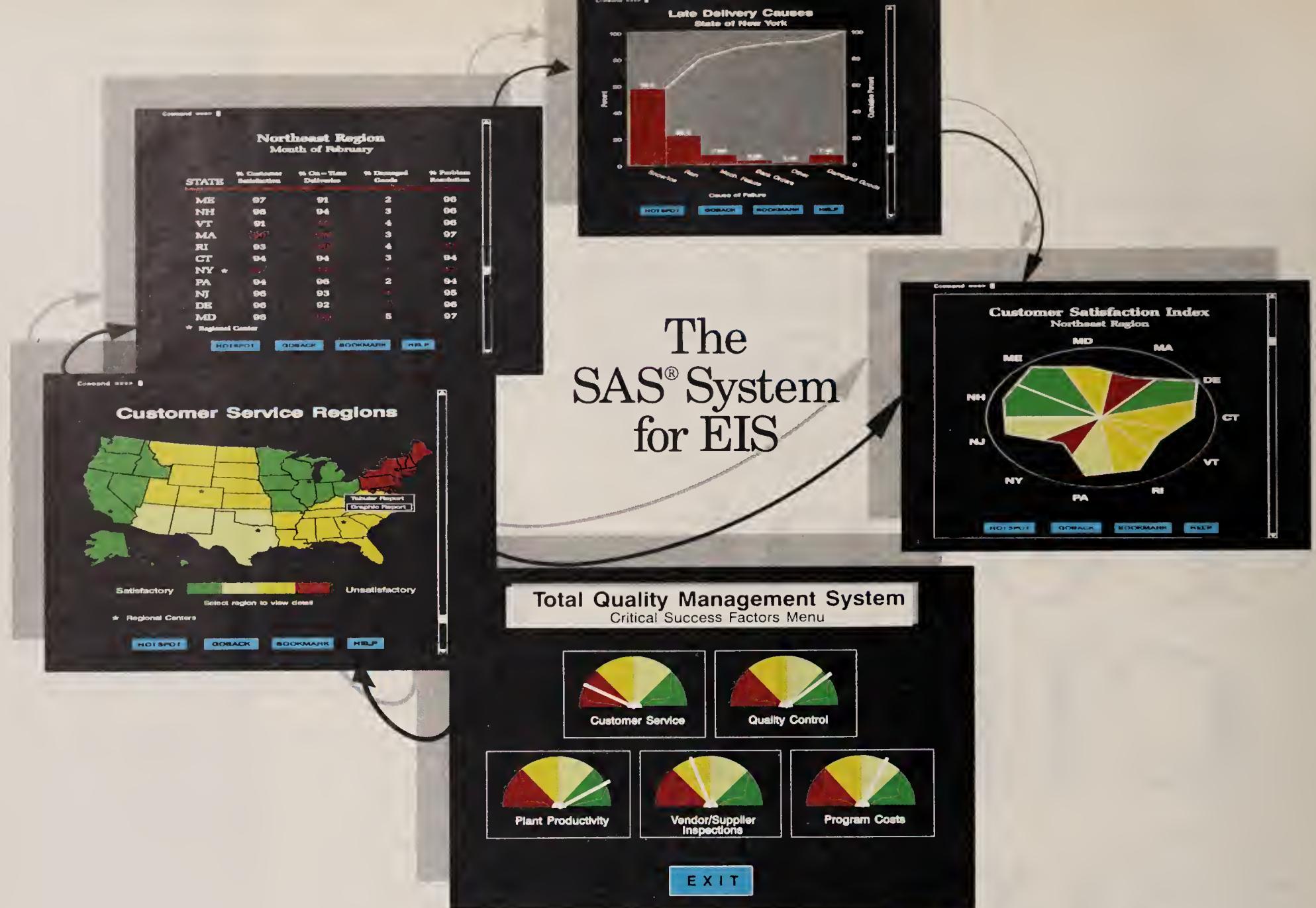
IBM could not be reached for comment.

Given the hefty costs of switching to a GUI, you'd think IS managers would want to be sure of some big payoffs. Not so.

More than 90% of nearly 400 IS managers responding to the MMA/IDG study say they have not measured the savings, if any, of moving to a GUI.

In fairness, Roukas says many believe the justification is GUIs, page 67





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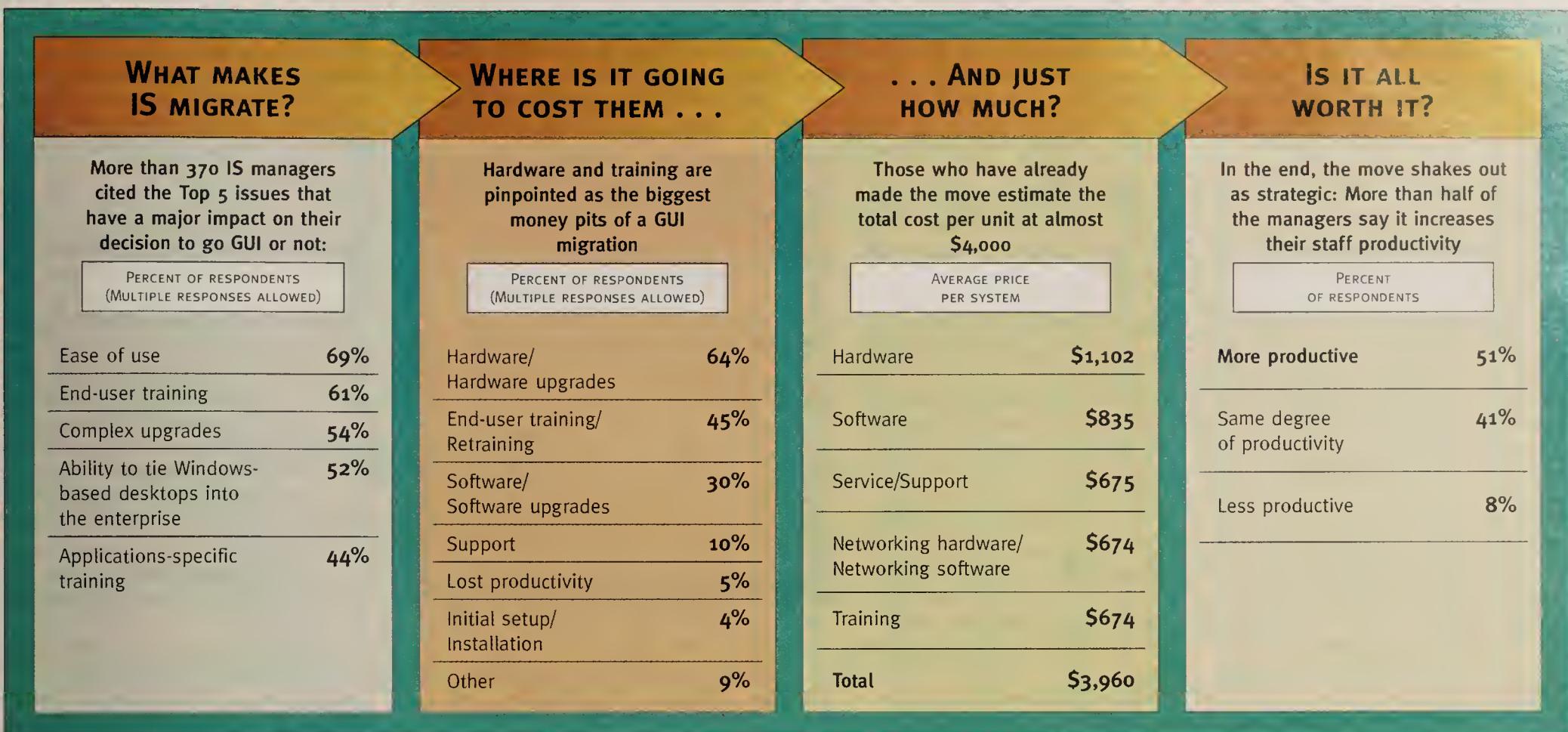
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Point, click

CONTINUED FROM PAGE 65

strategic, not economic. "Microsoft is seen as very strong, and this is the way Microsoft leads us," he says. Windows buyers "don't want to be the next generation of ICS Cobol users."

Bill Cornfield, president of Windows Support Group, Inc., a New York consultancy, agrees that Windows is often part of a larger business plan. As a result, many managers do not break out their cost as a separate item, he explains.

The bottom line is this: While many IS managers say they expect benefits from the migration, few count on being able to measure them directly. Instead, GUIs are viewed as a necessary front end to larger corporate initiatives.

At Consumers Gas Ltd. in Toronto, the move to Windows is part of a five-year re-engineering plan, explains W. Don Brewer, director of information services.

While the whole project is estimated to yield a 20% return on investment, Brewer, a chartered account, acknowledges that "we've formally valued our gains in productivity [from moving to a GUI] at \$0."

The reason?

"The ultimate benefits that will come from giving our people new capabilities will be greater than the hard dollar benefits I can demonstrate," Brewer says. "They may not be ones I can point at, but

if I save two hours for a manager each day, it will show up over the years, as people will work much more effectively."

Like many, Brewer says GUIs will fly only if they are presented as part of an architecture decision that will yield hard dollar benefits.

Why bother?

So if GUIs are expensive and hard to justify, why is IS so fond of them? Surely the lure must be more than just a pretty face?

Lower administrative and help costs are one payoff of standardizing on Windows, Dunkle offers. "But what you really want is the ability to do dynamic information sharing." Many organizations install Windows in place of 3270 terminals or PCs to work with on-line mainframe corporate data.

"I don't think GUIs necessarily make things work better," says Richard Campbell, chief of research and development at Federal Deposit Insurance Corp. in Arlington, Va. The agency is now approving OS/2 2.1. "In fact, I can argue that people spend more time making the stuff look better than actually producing it, so it's not the GUI we want. It's the multi-tasking," he says.

Productivity payoffs from users able to do several tasks at once will be worth it, Campbell says. Still, there

are sticky cost issues.

Nearly half of the agency's 15,000 PCs are ancient IBM PC AT machines, and hard-pressed managers are eager to avoid new purchases. Even the few users

Campbell expects will be able to justify OS/2 will probably continue to use their character-based applications to save money. So for now, the direct GUI benefits

remain at arm's length.

At the Blue Cross/Blue Shield Association in Chicago, senior consultant Jonathan A. Handler says, "The most impor-

Quick. Think of a company with a much broader line of business UNIX computers than IBM.

tant application for GUIs in our plans is imaging under OS/2, Unix or Windows."

GUIs also show up in customer service, when "heavy demands on the performance and the responsiveness of our systems require multithreaded multitasking under OS/2 and Windows," he added.

Others are sure the sweet spots are there but find it hard to pin them down.

"It'd be tough to measure productivity increases, but . . . with Windows, things became a lot easier, and the intimidation factor went away," says Jerry Deal, an information technology specialist at Southern California Edison Corp. in Rosemead, Calif. "Users used to not care if their PC stopped working, but nowadays it's a tool that's as useful as a telephone."

Some organizations have decided that the costs and headaches of cutting over to a GUI simply aren't worth it.

At the American Cancer Society's data center in Austin, Texas, OS/2 is in heavy use on servers, but users run character-based applications because "the costs of moving to a GUI are prohibitive," says Jerry S. Noble, director of telecommunications and PC support at the ACS.

Platforms Lite

Some IS managers, aware of how costly GUIs can become, are trying various tactics to keep costs down. Many are fitting

the costs of a GUI migration into a natural upgrade path for hardware and software. Others are migrating piecemeal, which allows companies to cushion the costs of more expensive hardware and new software, as well as training costs.

Some, including the Massachusetts Bay Transit Authority (MBTA) in Boston, keep hardware upgrades to a minimum.

"Windows turns a 386 into a 286," says Wayne Dunn, manager of end-user support at the MBTA. "It runs, but if I want optimal performance, my practical experience is I need 8 megs of RAM and a minimum of 120M bytes of disk space."

Dunn estimates it would cost about \$700 per system to optimize his IBM Personal System/2s for Windows — about \$300 for additional RAM and \$400 or so to switch from a 60M-byte hard disk. He says the MBTA has no plans to make blanket upgrades of its desktops. "At some point we'll make a move to 32-bit applications, but I can do that on my own time and my own budget, not as part of a migration" to a GUI, he says.

Other companies are containing costs by being selective about who gets high-powered GUI platforms.

Michael J. Henderson, PC coordinator

at James River Corp.'s research facility in Neenah, Wis., says the firm will give Windows and OS/2 to its 290 users this year but will roll out software "on a request basis as users come to us. We keep

fell swoop because in an organization of our size, there are always people who don't need to do GUI applications," says Don P. Babcock Jr., manager of user services. He says a decision early on to buy 386-based systems let Cajun avoid the cost of upgrading numerous 286 machines or buying new PCs. When it needs to, Cajun upgrades 286s for \$300 or \$400. Babcock says the firm also continues to use DOS software under OS/2, only upgrading where necessary.

Despite the headaches, big adopters say they believe the payoffs outweigh the headaches. "There are a lot of strategic reasons to move to Windows," says Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. The San Francisco utility believes GUIs make applications easier to use and thus decrease the need for training in the long run. PG&E has already rolled out 10,000 Windows packages and is planning to install another 10,000 copies.

"Before we continue, we need to know if it really makes the business case," Beckman says, adding that early evidence suggests the switch to GUIs is paying off. But there may be a more compelling reason to continue, he says. "Even if this proves untrue, application development is focused in the Windows environment, which may make migration a moot point."

BEST WINDOW BOX

Fortune 1,000 IS managers surveyed say the optimum configuration for running Windows is a loaded 486

CPU:	486
Monitor:	Super VGA
RAM:	8M bytes
Storage:	121M-360M bytes

Source: IDG Research Services/Microcomputer Managers Association

our hardware pretty much state of the art, so it's primarily software we're concerned about, as well as training and support," he says.

Despite a move to OS/2, Cajun Electric Power Cooperative, Inc. in Baton Rouge, La., has not undergone widespread upgrades of old machines.

"We haven't needed to upgrade in one

Quick. Think of a company with better business UNIX price/ performance than IBM.

Training: It'll cost you

By Michael Fitzgerald

While hardware upgrades can quickly raise the cost of switching to GUIs, it's training and support that really hurt, experienced IS managers say. Their advice: Plan carefully.

"You definitely have to have a well-coordinated plan and good support people behind it," says Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. He says his support staff got Windows before any employees did and created a "Windows cookbook" of tips and tricks. They also established a corporate bulletin board for Windows information swapping.

IS managers in large firms considering Windows might do well to emulate the foresight of Michael Henderson, PC coordinator at James River Corp.'s Neenah, Wis., research facility. GUIs are "a different enough environment that there is going to be retraining for our users," he says. "Support will take a major effort on the part of our department."

Estimating how painful the cost of added support will be can be tricky, though.

Unlike software and hardware, training is a "soft" cost. Ideally, of course, time spent learning the new interfaces is supposed to be offset by productivity boosts. Unfortunately, both are difficult to measure. One thing you can bet on: The costs will probably be more than you thought.

"There's a large training factor, and it's more expensive than people would have you believe," acknowledges Bill Cornfield, president of the Windows Sup-

port Group, Inc. in New York.

For example, at Brisbane, Calif.-based Hitachi America Ltd., the move to Windows will boost the IS training budget by 30% for two quarters while GUIs are implemented, says Terry Nugent, office automation specialist at the firm.

As for support, Don P. Babcock Jr., manager of user services at Cajun Electric Power Cooperative, Inc. in Baton Rouge, La., notes: "In a Windows environment, every new application's parameters affect all the others, and you run into conflicts. Unraveling those is knotty at times."

Sure enough, at Corporate Software, Inc., a Canton, Mass.-based reseller, Glen Whittaker, technical support manager says Windows has added new dimensions to the calls for user help. Among the calls handled by the firm's help desk are calls about unrecoverable application error to general protection faults.

For some IS shops, training costs are not a big issue, especially after the initial cut-over. "If anything, our training costs have probably diminished as a result of moving to a GUI," Babcock says, a claim consultant Cornfield says is credible.

After the initial learning curve for an application, IS managers say users often benefit from the Common User Access built in to GUI applications.

"Basically, it's a day's worth of training for every employee who has a PC," says Wayne Dunn, manager of end-user computing at the MBTA in Boston. "My cost there is minimal, and the corporate cost is not great."

Re-engineering gets real

IS is gearing up to convert concept into action

By Nell Margolis

Jobs imperiled and professional identities in limbo, information systems leaders are beginning to transform "re-engineering" from buzzword into battle cry.

"This is the year when re-engineering is going to move from talk to at least the beginnings of action," said Charles L. Bowerman, chief information officer at Phillips Petroleum Corp. The Bartlesville, Okla., firm, he says, has been actively discussing the topic since 1991.

Indeed, zeal for re-engineering — the deed, not the word — is echoing from IS strongholds across the industrial landscape. A new CSC Index, Inc. report said nearly three-fourths of 407 businesses surveyed now have a "major formal process improvement effort" under way (see chart).

Companies ranging from The Home Depot, Inc., a \$2 billion home improvement retailer based in Atlanta, to Bayou Steel Corp., a small Louisiana company, are mobilizing to radically rethink how they do business and deploy technology.

Slow spread

"Automation is creeping into every aspect of this company's business," said Chuck Theaux, who heads the seven-person IS department at Bayou Steel, a mini-mill in LaPlace, La.

"More and more, we're finding ourselves in areas we never used to go into. We're getting pulled into a broader definition of IS than ever before."

"Increasingly," Theaux added, "we're getting viewed as the go-getters."

"Re-engineering is a term that's suddenly in vogue after being around for years," said Andrew McKenna, senior vice president of information services at The Home Depot, which has 180 branches. The current interest, he said, is fueled by a growing realization that the recession and tougher competition will require businesses to make quantum changes to survive and thrive. Many IS professionals, McKenna added, are be-

ginning to see that those who don't serve or drive re-engineering efforts are on the road to extinction.

That concern is evident in CSC Index's recently released sixth annual survey of IS management issues. The Cambridge, Mass., consultancy asked high-ranking IS executives at 407 large U.S. and European firms to rank their 10 most pressing challenges for 1993. "Re-engineering business processes" led the lists on both sides of the Atlantic.

Re-engineering also topped the same chart in CSC Index's 1990 survey, bowing in 1991 to "Aligning IS and corporate goals."

Grim findings on the budget front indicated that for IS organizations, rethinking the ways and means of working so as to accomplish more and better with less — i.e., re-engineering — may be an effort best begun at home. CSC Index respondents in North America reported an average 1993 IS budget increase of 2.5% — a 29% drop from last year's 3.5% increase. In fact, according to CSC Index, the figure has been sliding for six straight years.

Dollar-hobbled IS chiefs in North America, however, still emerged as being well-positioned in contrast to their Europe-based peers. CSC Index survey results from Europe showed a projected 0.4% IS budget increase — a cruel cutback from last year's

great expectations of a 5.2% increase.

Hard times

Companies that have begun to take action on re-engineering programs say translating the concept into reality is, predictably, difficult.

"In theory, it was great," recalled Bowerman, whose company participated in a CSC Index-sponsored roundtable on the topic. "But every time we started to talk about what actions people had taken, things began to fall apart. It's not as easy as it looks."

Slowing efforts is a lack of definitive resolution of several key issues, including too few architectural standards, a re-

luctance to embrace sweeping corporate cultural change and fundamental disagreements as to what re-engineering really means and what role IS should play.

Even so, executives said efforts are moving off the drawing pad and into the workplace.

"We've developed a set of architectural principles for establishing some standards in the information technology area," reported Bowerman, "and we're focusing on making sure we have a real understanding of exactly what the business goals are so that we can indeed become an enabler."

On the technological front, as well as the strategic, CSC Index's 1993 survey found escalating user demands and shrinking IS budgets combining to focus user interest on getting the most out of what

they've already got.

Some 47% of the North American respondents tagged client/server computing as the "emerging" technology of greatest interest to their organizations — a contrast with 26% last year and 7% in 1991.

Document imaging and computer-aided software engineering — like client/server and technologies that have been around for a while — rounded out the Top 3, leaving genuinely emerging technologies such as pen-based computing, multimedia and videoconferencing in the dust.

What we're seeing here, several IS executives said, is not a falloff of interest in newer, less proven technologies but a sharpened sense of immediacy on the part of IS organizations.

Similarly, "updating obsolete systems" — often a key element in a re-engineering project, according to CSC Index — leaped from No. 18 to No. 8 in the

North American vital IS issues ranking, the steepest climb on the chart.



Quick. Think of a company with a better business UNIX environment than IBM.

Code of many colors

There are four different ethics codes for computer professionals in the U.S., and each one has its weaknesses. A single, coherent and clear ethics code — much like the medical profession's Hippocratic oath — would do a better job of telling clients, users and society just what they should expect when dealing with computer experts.

The absence of a well-established code of conduct in the computer field is probably due to the fact that the field is relatively young (compared with the medical and legal professions), and technological change keeps raising new ethical issues.

Also, the public may not yet have realized the severity of the problems that can be caused by unethical computer professionals.

Source: "Ethical Standards for Computer Professionals: A Comparative Analysis of Four Major Codes," a paper by Effy Oz of Wayne State University, presented Nov. 3, 1992.

Networking bridges for women

Working in the male-dominated computer industry can be an isolating experience for women, but now there is an online forum for women in information systems.

Called Systers, the forum is the brainchild of engineer Anita Borg.

The forum currently boasts 1,200 subscribers in 75 companies and 150 colleges worldwide.

The interchanges run the gamut from technical discussions to job postings to discussions on comparative pay and which computer companies treat women most fairly.

For more information, send an electronic-mail request through Internet to: systers-request@wrl.dec.com.

Source: *Working Woman*, November 1992, Catherine Freedman, author.

Machiavelli on re-engineering

"There is nothing more difficult to take in hand, more perilous to conduct or more uncertain in its success than to take the lead in the introduction of a new order of things."

Source: Niccolò Machiavelli, *The Prince* (1532).

Global outsourcing

Farming out information processing to contractors in foreign countries has become a small but rapidly growing portion of the outsourcing market. India, Singapore, the Philippines and Ireland are among the countries with low-wage, well-trained and English-speaking labor pools that can provide data entry, programming and transaction processing at low costs.

However, the remote locations make project management and quality control more difficult.

In addition, the notion of exporting jobs could raise big political problems in the U.S.

Source: "Global Outsourcing of Information Processing Services," a paper by Uday M. Apte and Richard O. Mason of Southern Methodist University, presented Nov. 4, 1992.

The people button

When it comes to implementing an imaging project, the strategic advantages of use are evolving from "having more" to "knowing more." With imaging, this knowledge is more than learning which button to push. It is a continuing search for functionality from the equipment and the people who use it. "Being smarter" is not something that happens all at once; it is part of an incremental process of improvement. Expect users to resist change, and try to educate them on the big picture rather than on simply on how to use one part of the system.

Source: Special Report: Electronic Imaging's Impact on People, "Training: Programming the Peopleware," by Kathleen Hawk, *Inform*, January 1993.

Compiled by the CW staff.

Calendar

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Document and Image Management Systems Conference. Lake Buena Vista, Fla., Feb. 7-10 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C.S. Report, Uwherland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

Compcon Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706.

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7208.

"Doing Business in the Pacific Rim" International Conference. Sydney, Australia, Feb. 25-26 — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

FEB. 28 - MARCH 6

CompTel '93. Washington, D.C., Feb. 28-March 2 — Contact: Trade Associates, Inc., Rockville, Md. (301) 468-3210.

Share '93. San Francisco, Feb. 28-March 5 — Contact: Share headquarters, Chicago, Ill. (312) 822-0932.

Advanced Object-Oriented Analysis and Design: The State of the Art. San Diego, March 1-4 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Executive
Track

A new management team announced in the wake of the recent merger of Kansas City, Mo.-based Centel Corp. and Washington, D.C.-based Sprint Corp. includes **Ronald J. Ponder** as executive vice president and chief information officer. Ponder retains the title and office he assumed when he joined Sprint a year ago from **Federal Express Corp.**, where he helped spearhead the total quality management program that led FedEx to a

1990 Malcolm Baldrige National Quality Award.

Boston-based **Saunders Real Estate Corp.** has a new MIS manager: **Bonnie D'Agostino**. At her new post, D'Agostino, who formerly served as accounting and systems manager at Cambridge, Mass.-based Altid Properties, assumes responsibility for Saunders' entire slate of computer-related activities.

John P. "Jack" Thompson, CIO at Sparks, Md.-based **McCormick & Co.** since 1983,

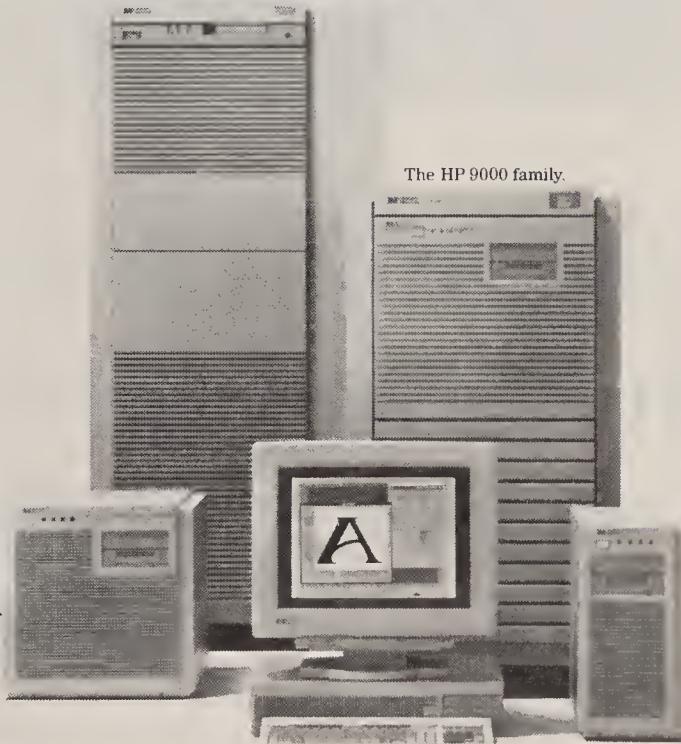
retired from the company effective the first of this year. Thompson joined McCormick as MIS director in 1971 with a mandate to develop and implement an integration strategy for the condiment manufacturer; he rounded out his 22 years of service as the head of an information systems organization charged with providing consulting services on systems design and implementation, office automation and telecommunications to the company's worldwide operations.

Recently, before his official retirement, he took on the additional charge of administering the firm's quality program.

Thompson's mantle now passes to C. Robert Miller II. A 26-year veteran, Miller most recently served as IS director for the firm's Flavor division.

In Oak Brook, Ill., **Mei J. Trudeau** has been promoted to the position of senior vice president and CIO of **Official Airline Guides (OAG)**. Trudeau, who was an 11-year United Airlines veteran when he joined OAG in 1981 as director of systems planning and development, now shoulders responsibility for the company's information systems and for new business arrangements with airlines, their computer reservation systems and travel agencies.

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company that's sold
\$6 billion more
in UNIX systems
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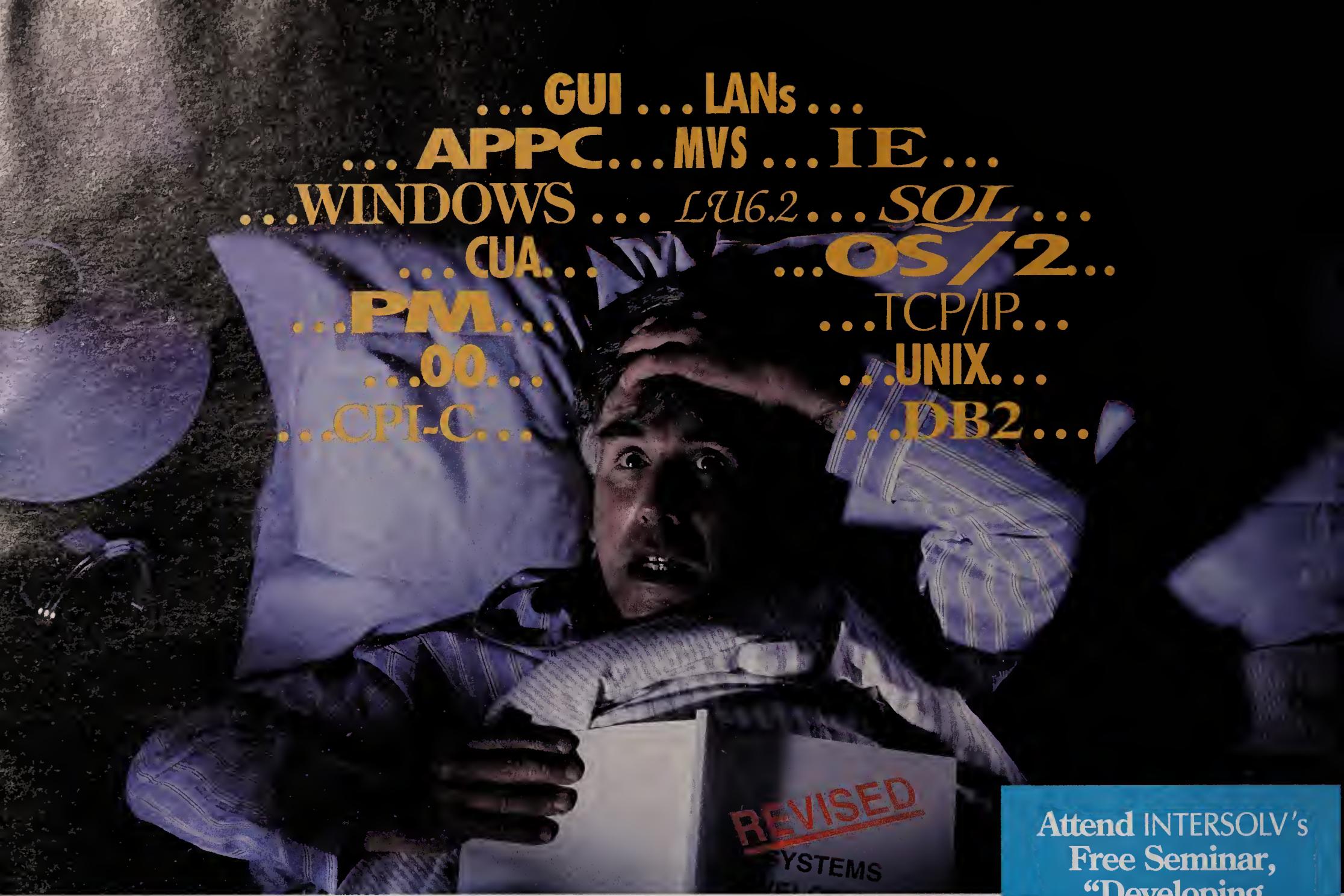
Sales figures based on UNIXWORLD Annual Report, 1985-1992. UNIX is a registered trademark of The System Laboratories Inc. in the U.S.A. and other countries. ©1992 Hewlett-Packard Company GS19301

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Houston, TX	February 5, 1993
Indianapolis, IN	March 11, 1993
Los Angeles, CA	February 3, 1993
Minneapolis, MN	March 4, 1993
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New York, NY	February 9, 1993
Orlando, FL	February 11, 1993
Philadelphia, PA	March 11, 1993
Phoenix, AZ	February 24, 1993
Pittsburgh, PA	February 24, 1993
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Richmond, VA	February 25, 1993
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Tulsa, OK	February 9, 1993
Washington, DC	March 3, 1993

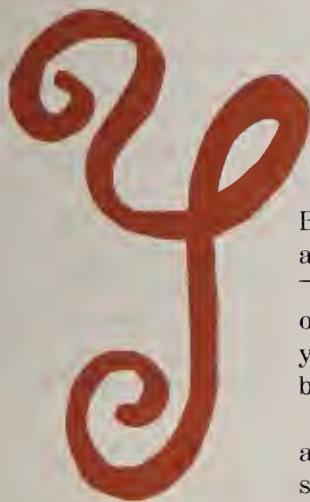
INTERSOLV



Client/ server tell-all



Julia Falcott



By Shaku Atre
and Peter M. Storer

You might not know this, but you and Christopher Columbus have a lot in common. Just think about it. The adventuresome Italian got some funds from a couple of top executives (King Ferdinand and Queen Isabella of Spain) to explore unknown territory in the hopes of enriching the coffers of a country.

So maybe you don't carry a sword, but you're a risk-taker just the same. You've requested money from your business executives to improve your company's fortunes through technology. In your case, however, the terra incognita you're thinking of exploring is client/server computing.

Chances are, you have little experience in client/server-type applications. While this ignorance won't get you killed, it can lead to mistakes in designing and implementing client/server applications.

What follows are some pointers to help you avoid the more common client/server mistakes information systems chiefs make. These tips are culled from our experience with application sites.

Select a mission-critical application as your first client/server application. Most people will give you the exact opposite advice. However, given today's business environment and IS budget restrictions, it may be impossible to promote a complex and expensive project such as a client/server implementation without compelling justification. Most business managers today are unwilling to invest large sums of money to "plan for the future" or "gain experience" in systems.

Atre is president and Storer is director of client/server consulting at Atre Associates, Inc. in Rye, N.Y. Atre Associates consults on client/server application design and development, software evaluation and selection and training. The firm will soon publish a set of client/server guidelines and standards.

10 things you should know before you tackle your downsizing project



Know your application; know your data. Client/server environments require aspects of application planning that you've probably never had to consider before.

For instance, you have to decide how you want to split client and server functionality among such program aspects as the user interface (presentation), logic and presentation flow (function) and data management. Do you want your client machine to be a dumb window into the database management system, with the server handling all other chores? Is some of the logic and flow controlled by the client and some by the server? Or is the server going to act as a central repository, with clients controlling everything except data management?

Each of these options represents a practical model for designing your application; you must make an appropriate, informed choice based on your knowledge of the application.

Knowing your application also involves a choice about where your application logic lies. You can have the rules that apply to your data coded and applied directly at the server, avoiding the need to encode it in the applications programs. In this way, any application that touches your data will automatically have these rules enforced.

Planning also consists of knowing how much of a vendor's SQL extension functionality you should use. Almost every server uses some extensions to SQL for performance reasons. For example, using precompiled stored procedures can dramatically reduce query execution time.

However, if you feel your application may grow enough to warrant a platform change or if you're sharing data across multiple platforms, extensions can be problematic. They make your application less portable.

In designing your application's use of extensions you must weigh the performance benefits that extensions provide against the loss of portability (read: application maintenance).



Pick the right server for the job. One of the most critical aspects of a client/server environment is the server. By "server," we mean the total

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environment in which the database work is done, including the physical server computer, the DBMS running on the computer and the supporting communications software between the server and its clients.

From a physical computer standpoint, if you have the luxury of purchasing a server for the application, buy as much computing power as your budget will allow. Because the CPU for this machine will likely be doing the bulk of the database work, you want to maximize the horsepower available.

In terms of DBMSs, keep in mind that different DBMSs are optimized differently. Some have query optimizers that are oriented toward achieving the maximum number of transactions per second for simple (usually one-table) transactions; these are most appropriate for high traffic/low data analysis applications. Airline reservation systems, for instance, would typify this class of DBMS.

Other DBMSs support relational concepts such as referential integrity and set-oriented processing.

These DBMSs tend to be strong in multitable query optimization and may support tools such as stored procedures and cursor management (for working with result sets). Such systems are geared toward a data analysis/decision support system environment.

The key is to know what your needs are and how the server can meet those needs: Do you want it optimized for speed or for handling complex queries?

Finally, don't overlook the communica-

tions aspect of your server. Each hardware/software combination will support one or more well-defined network- and transport-layer communications protocols, such as Named Pipes (standard for OS/2), IPX/SPX (for Novell, Inc. networks), Transmission Control Protocol/Internet Protocol (typically used in a Unix environment) and so on. It is important to understand how this communications environment integrates with your existing environment.

For instance, adding Named Pipes support to DOS or OS/2 clients on a Novell network is simply a matter of installing the appropriate requestor software modules (OS/2 or DOS) on the client. For local-area network server networks, however, the client PC must have "server" software installed so it can share its Named Pipes resources.

Connectivity is one of the most complex aspects of client/server. By matching your server's hardware, DBMS and communications to your existing platforms, architectures and needs, you can achieve a cohesive, integrated computing environment.

Realize that client/server environments don't always require a graphical user interface (GUI) front end. GUIs don't necessarily go hand in hand with client/server. In deciding on your application's front end — including deciding whether you even need one — consider the nature of the application and the skills and requirements of the users.

Make sure you know what kind of environment your end users are accustomed to. If they are not "mousers," do they want/need a GUI, or will they be more comfortable with a text-based screen?

In the case of a data-entry function, for instance, a graphical front end with slow screen refresh or one that forces users to switch between using a keyboard and the mouse can slow down and annoy data-entry personnel.

Don't force high-tech changes on low-tech users. Make sure users need the changes and are prepared for them.



Think twice about minimal client hardware requirements. One of the selling points of client/server computing has been the "fact" that you don't have to use powerful PCs as clients. Because all the horsepower is centralized in the server, the story goes, client workstations can be cheap, low-end machines (e.g., Intel Corp. 8086- or 80286-based).

But that's not the case. For the most part, low-end PCs are insufficient to run your application. One company we know of attempted to use such low-end PCs as clients by supplying the machines with upgraded replacement CPUs. Unfortunately, the company experienced a series of memory management nightmares, including system crashes, because the machines were not natively designed to support the CPUs. The IS staff ended up replacing the computers with native Intel 80386 machines.

The need for powerful machines is especially acute if you are implementing a GUI front end, the majority of which run in a Microsoft Corp. Windows environment. Windows typically requires at least a 386 PC with plenty of memory — at least 4M bytes — to achieve even adequate performance.

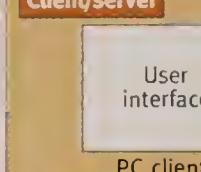
Even without the GUI factor, client/server means networking (network and device drivers residing in memory), which means sufficient computer brainpower to manage these resources.



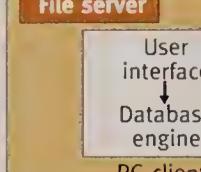
Use triggers — cautiously. The most common enforcer of referential data integrity available in database servers is the trigger. This is a piece of code stored directly in the server that is automatically called on whenever a "triggering event" (such as a record insertion, record deletion or record update or modification) occurs. Triggers are not limited to referential integrity, however; another way to think of triggers is as rules implemented at the server that are applied to every request made to the server.

The client/server vs. the file server model

Client/server



File server



In the client/server model, all database processing is done at the database server. Only query results are sent across the network.

In the file server model, all database processing is done at the PC. The file server sends only the contents of a file, which the DBMS processes at the client machine.

Source: Atre Associates, Inc.

CW Chart: Janell Genovese

This is a powerful tool — and one that can get you into trouble if used improperly. There are two types of triggers to avoid: triggers that are too general in their triggering conditions and triggers that try to accomplish too much.

We have seen a situation in which an improperly constructed trigger (in this case, one whose triggering conditions were too broadly defined) brought an application to its knees. The trigger turned a simple update based on a key field — an action that should take only a fraction of a second — into a lengthy extravaganza of record, page and even table locking as the changes to the record were programmatically checked for referential accuracy.

Use triggers cautiously and appropriately. For instance, you may want your trigger to fire only after all rows affected by an update query have been altered rather than having a trigger execute once for each affected row. Some servers will allow this.



Avoid making your defined database size too large. You won't hear this advice too often. Most IS chiefs are told not to make their database size too small. Many servers, however, "preallocate" storage, which is then managed exclusively by the DBMS. This situation cuts down on operating system calls that allocate physical storage.

As a result of this preallocation, it's usually a simple task to increase the amount of storage available to your database by adding physical and/or logical devices. On the other hand, once you have set aside this defined amount of space for your database, it is difficult to shrink your defined size to allocate storage to another database. The DBMS spreads your data among the defined devices according to what it thinks best.

Plan ahead for growth, but don't wildly overestimate the amount of space you will ultimately require. If necessary, revise your defined allocation upward at a later time.



Go to use rapid application development techniques. One of the side bene-

Telling it like it is

What is client/server computing, and how does it differ from conventional computing?

The fundamental characteristic that sets client/server computing apart from the rest of computing is the distribution of computing resources. In its broadest sense, client/server means one CPU (the "client") formulates a request and passes it along to another CPU (the "server"). The server performs the work requested by the client and returns the results of the processing back to the requestor.

The client/server paradigm is most frequently applied in the database world. In this construct, the client CPU formulates a database request and passes it along to a server CPU. This CPU processes the request and returns an appropriate response to the client. In a request for data, for example, the server will perform the query requested by the client and return any records satisfying the query. On an insert, delete or update request, the server will return a status indicating either the success or reason for failure of the request after it has processed the request.

There are many advantages to this method of database computing. Chief

among these is the opportunity to centralize the computing horsepower. Because the client is (usually) responsible only for program logic and front-end presentation, it requires fewer resources than if it were also responsible for doing the actual processing.

By the same token, the server should have as much computing power as is available because it will be solely responsible for performing the processing work of the application.

Another important advantage to client/server computing is the centralization of program access control logic. Many database servers support rules implemented at the server that are applied to every request made of the server. Typically, these rules are used to ensure referential integrity and to control access to data.

By having these rules embedded in the fundamental logic of the server, constraints such as "Let only those people who have update privilege update salary data columns" or "Don't fulfill any request that will return more than 10,000 rows of data to anybody without that privilege" can be written once and applied uniformly to all applications that touch the data.

— Shaku Atre and Peter M. Storer

fits of client/server development is that the PC client platform supports a wide variety of tools that support rapid application development. Most front ends either include or support a prototyping tool, which will allow you to create dummy screens for users' approval in days, not weeks.



Expect to overhaul established IS skills. Skills that your IS staff has learned may be either marginally relevant or even wholly irrelevant to the client/server application task at hand. For instance, client/server applications presume a SQL language interface to a relational DBMS. Data navigation skills that were learned for nonrelational databases will not apply in this environment. Also, programmers who have mastered High-Level Language Application Programming Interface design for 3270-type screens may find their knowledge useless in building a GUI screen.

A SQL tip

What exactly is "standard" SQL anyway? Is it the SQL 89 ANSI standard (which does not include any referential integrity mechanism)? Is it SQL 92 (which is about to be voted on)? Is it SQL3? As you design your client/server architecture, make sure all the component pieces speak the same dialect. "Standard SQL-compliant" often means different things to different vendors.

One IS chief we know, whose staff was experienced in developing multiuser, file server-based applications, facetiously observed that conversion from server-based to client/server "is easy—just find all the VIEW and EDIT statements in the code and rewrite those sections." In Borland International, Inc.'s Paradox, those statements make up the heart of the application, and removing them requires a fundamental system redevelopment and the use of new skills.

IS staffers must become familiar with the relational model and the SQL dialect to develop and work with the system. It is vital that IS be comfortable with the concepts of normalization (breaking data down into relationally atomic units) and transactions (units of work and how their size and complexity can influence performance).



Anticipate user expectations. One of the essences of client/server computing is that most of the complexity happens "under the covers" — unseen and unknown to end users.

While you may think this will spare users a lot of agony, it may have the opposite effect. Because users don't know what is happening, they may misinterpret what is going on and blame the system or the IS staff.

For example, while you may have a join across seven multimegabyte tables happening at the server, all your user sees is a screen notation that says "retrieving information — please wait" for the duration of the task. To the user, it may as well read, "System is slow and holding you up." Furthermore, the switch to a SQL front end may be especially frustrating for end users accustomed to working

with PC-based databases. These databases enable users to browse through the data, inspecting records in a random, unstructured fashion. On the other hand, a SQL front end to server data imposes an access control layer between the user and the data. Users feel cheated because they can't "touch" the data directly.

Between not knowing what is going on in the system and having a new layer separating them from their data, end users may feel dissatisfied with the client/serv-

er application. It is the IS department's job to understand and anticipate these feelings, educating users before they become unhappy and undermine client/server efforts.

As with any new technology, you have to build some "surprise time" into your application development timetable. Hopefully, the advice presented here will help you avoid problems and make your trip to client/server a smooth one. •

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Computer Careers

Neatness doesn't count; clutter does

From the trenches

By Bill Levine



IT'S NOT ENOUGH to be dressed for success. Now the computer professional must also be "desked" for success. The ideal work area can boost your information systems career even more than an uncle in personnel.

A powerful collection of vendor coffee mugs and a hexadecimal calendar are good ideas. But an upwardly mobile work area should start with a firm foundation of hard-copy printouts — the only solid evidence that will prove you're doing more than just basking in the glow of cathode rays all day. Besides, there is no statute of limitations on programmer responsibility for retaining documents. You never know when the 1979 purge listing will need to be reviewed again.

Just the right amount

A career-enhancing cubicle need not have a forest of paper on the floor. In fact, too many dumps is a no-no because colleagues may think that's all you produce. But a small arboretum is well-advised.

The only acceptable excuses for not

having printouts in your work area are if you're in the first five minutes of employment or you're a manager in training.

It used to be that a work area was anchored by a dumb terminal. Now work areas have amazingly smart PCs. Make sure your machine reflects well on you. While you'll receive many points for a PC that can communicate with networks ranging from the Strategic Air Command to a McDonald's drive-thru, an even better status symbol is a PC that communicates with the host.

The way the PC responds to you is equally important. A PC log-on can't just state "access permitted." It should show respect for you by responding, "Good morning, sir. Your mission, should you choose to accept it..."

The flimsy walls of the typical work area have purposes other than merely allowing you to eavesdrop on colleagues' phone conversations. What is stuck on these walls can take you to the push-pinnacle of success.

Exemplary walls will be festooned with obscurely humorous cartoons with punch lines so esoteric and highbrow that only the Dalai Lama would get them. People who see these cartoons will regard you as an extra heavy and deep thinker (though you won't get invited to be on *America's Funniest People*).

To go along with these character-en-

hancing cartoons, you should plaster your walls with hierarchical charts because we all know a good computer analyst thinks hierarchically. Ideally, the chart should be of a recognized database, but it can also be a family tree, a dog's pedigree or a tennis ladder.

A nice accompaniment to the chart is a graph showing CPU use. It will prove that you're interested in efficiency and, more importantly, can read a graph.

The sky's the limit

How can you judge if your cubicle is of award-winning status? There should be reams of paper in the in-basket. Such an in-basket says that its owner has no time for leisurely reading. It's better for the bottom of this slush pile to be yellowing than for a computer pro to be caught checking up on his high-tech stocks. As a rule of thumb, unless the oldest magazine in the basket is *Abacusworld*, don't throw out any in-basket material.

Don't take pride in a pencil cup filled with freshly sharpened No. 2s. The outstanding desk will have only the computer pro's writing machine: the mechanical pencil. Only with this technical marvel can you generate the perfect collaboration of graphite and paper we all know as technical specs.

Even your desk calendar must show a commitment to computing excellence.

Leave the plain everyday calendars for someone else. An IS careerist would never have a calendar in which October had a lovely model hugging a basket of cute puppies in one hand and carving a pumpkin with the other, surrounded by peak foliage. Better choices: "Cobol verb of the day," "Great days in IBM history" or "Peripheral device of the month" calendars.

Finally, there are some objects that should never be displayed in the open: a hex conversion chart (shows that you can't convert in your head), a flowchart template (shows that you don't have a computer-aided software engineering tool) and a book titled *Understanding Your Friend Mr. Computer*.

Now that I think of it, it may be time for me to neat up my own personal space. But first I'll have to junk my personal library by getting rid of all my Monarch Notes to Cobol manuals.

Levine is a computer analyst at The New England in Boston.



What's it really like out there? Look around you. What are typical co-workers like? How are IS department meetings really run? Does THE GRASS LOOK GREENER FROM SOMEONE ELSE'S DESK? IS THERE MORE TO A JOB IN THE IS SHOP THAN MEETS THE EYE? SEND YOUR OBSERVATIONS — SERIOUS OR OFFBEAT, BUT ALWAYS CANDID — TO KELLY E. SEWELL, ASSISTANT EDITOR, FEATURES.

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Job close-up

Administrators protect data from the unauthorized

By Kelly E. Sewell

IF YOU ALWAYS wanted to be a police officer when you grew up but ended up in information systems instead, you may still be able to follow your calling by policing information systems. How? As a data security professional.

Jobs for data security professionals, both administrators and managers, are growing as companies become more aware of the need to protect their information.

"Data is a corporate asset," says Rod Horning, manager of information technology and security at Kelly-Springfield Tire Co. in Cumberland, Md. It needs to be protected from competitors, hackers, disgruntled employees and even current staff members.

Banks and government hot

The best opportunities for data security administrators are in financial industries and in government, according to Calvin Grimsley, data security officer at Time Warner, Inc. in New York.

"Companies in the private sector have information that should be protected, but there's no policy on it so most of them don't do it until something happens," Grimsley says. "But when you start talking about financial, banking systems and government, they have poli-

cies that say, 'You *will* have data security.'

On a day-to-day basis, data security administrators are in charge of maintaining security on platforms, assigning new users, helping users with password problems, auditing and keeping detailed records of violations and attempted violations and monitoring access of all the platforms, says Winey Carr, IS manager of database and security for Fresno County in Fresno, Calif.

Data security managers are more involved in policy-setting, creating an awareness of the need for security and ensuring that the controls they've developed work.

Most data security managers expect the data security administrators they hire to have two to three years of IS experience, preferably in applications programming or operations.

The IS background is helpful because it gives administrators a better understanding of how IS works, Grimsley says.

"Programmers that come from the applications side know what it is they're trying to secure, and they know how the operating systems work together," Carr says. This helps the administrator know where the holes are.

Because she is responsible for the security of a government system, Carr would also prefer if the administrator was familiar with state and local regulations because the job entails developing policies and procedures.

"I'd also like them to have knowledge of the platforms [VAX, HP, RISC System/6000, IBM mainframes, Application System/400s] and the security products available," Carr says.

Horning also prefers a knowledge of security products. His company uses IBM's Resource Access Control Facility but other popular security packages include CA-ACF2 and CA-Top Secret, he says.

Horning says data security administrator is not an entry-level position "because if you administer security centrally, then you are granting a great deal of trust to the security administrator because you're giving him the keys to the city."

But because most managers prefer to hire applications programmers into the position, a lack of experience isn't an issue.

In smaller companies, data security is not a full-time function but is included in a programmer's or systems analyst's position. In



companies with more than 400 to 500 employees, there is enough work to warrant having a full-time person doing data security exclusively. However, few companies have more than one person on the job.

As companies grasp the concept of securing their data, so are universities. Grimsley says he began teaching a data security course at New York University last year, and he says many universities are now adding such courses to their curricula.

Pluses and minuses

Most data security administrators say the position offers high visibility within companies.

"If you're with a company that's security-minded, it's a visible job. It allows you to get into all aspects of a corporation," Grimsley says.

If there's a downside to the job, it's that the administrative functions become routine after awhile, says Larry Scriven, a security administrator at Hay & Forge Industries in Hesston, Kan.

It's also not a glamorous job, Carr says. "You're a watchdog so you're looked on as a handicap."

"Nobody wants data security; it's a necessary evil," Grimsley says. But, he concedes that it's becoming more accepted. "Management is beginning to realize that it's something they really need to be involved in."

Carr adds that rewards come if nothing happens (such as a virus infection or a hacker break-in). She says it's rewarding to know "you have secured the environment—nobody has gotten in."

Kelly E. Sewell is assistant editor, features.

Data security administrator

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The successful candidate will possess a Bachelor's Degree in an appropriate area with a minimum of six (6) years experience in planning, implementing, operating, and/or managing technology programs in an educational or business/industrial setting. The candidate will possess superior communication, report writing, and interpersonal skills and will have demonstrated the ability to work effectively in a relatively independent role.

To apply, send a letter of application with resume to Larry C. Conner, Director, Division of Personnel Services, Kentucky Department of Education, Capital Plaza Tower, 500 Mero Street, Room 1614, Frankfort, KY 40601-1957. FAX: (502) 564-6771. The closing date for applicants is February 16, 1993 or until a suitable applicant is selected.

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Tupperware Manufacturing, a leader in the plastic injection molding industry located near scenic Myrtle Beach, SC, has an immediate opening for a manufacturing systems analyst.

The qualified applicant should possess a BS degree in Business or a related field and 5+ years of programming and analysis experience in an IBM DOS/VM or OS/MVS environment. A minimum of 2 years in the last five years of programming in COBOL, VSAM, CICS, and JCL is also a requirement. The qualified applicant should also have the ability to work with users and define their requirements, recommend solutions and offer assistance in implementing them. Experience in a client/server environment and commercial MRP II software, especially American software (ASI) is a definite plus.

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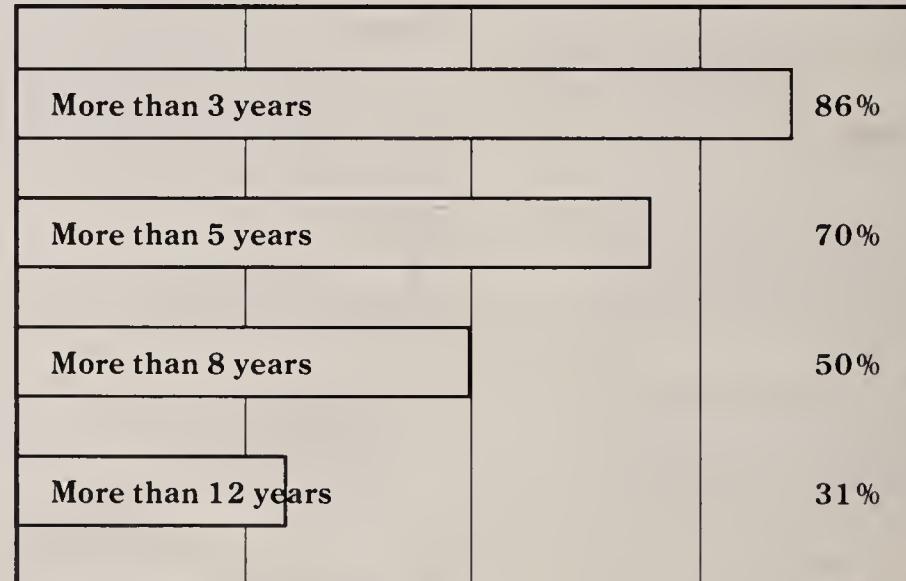
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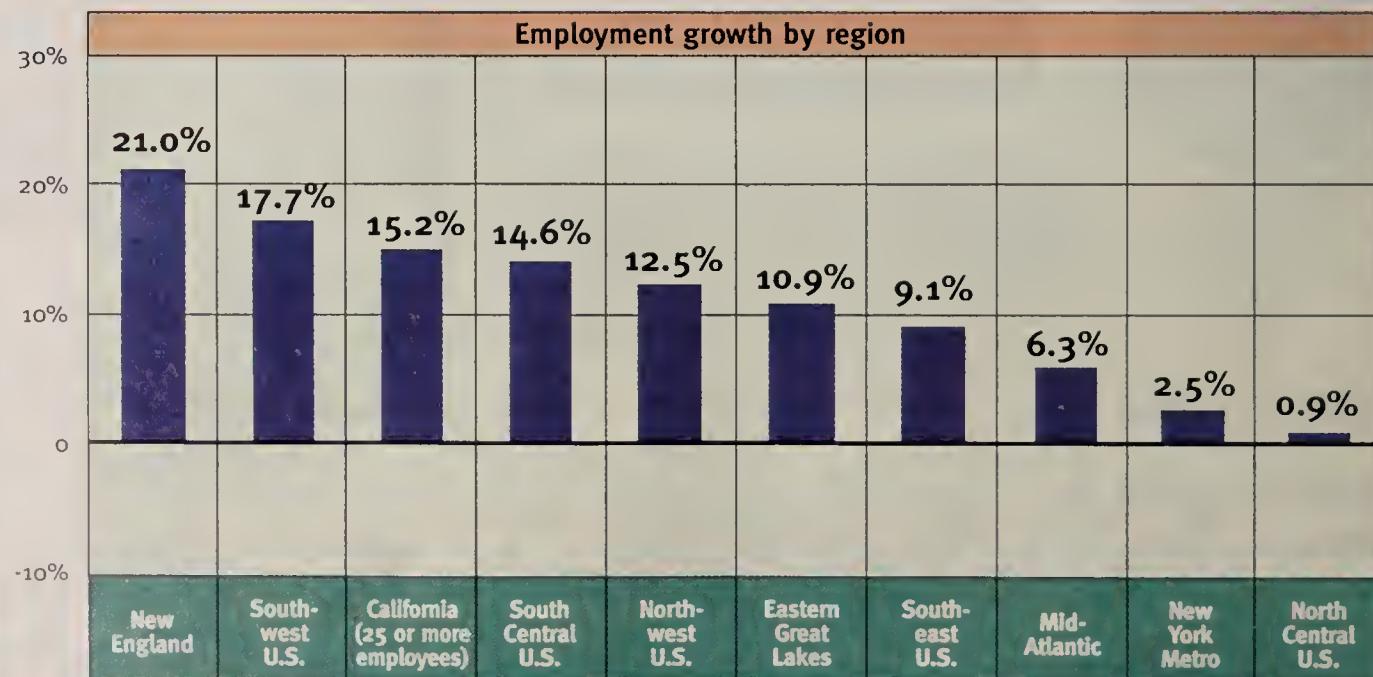
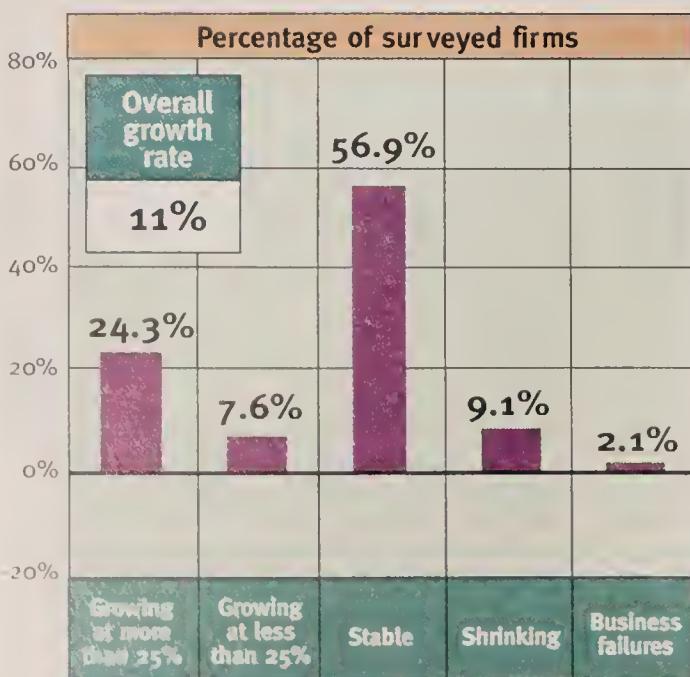
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Learn lingo to avoid lease contract 'gotchas'



By Joe Auer

WHEN NEGOTIATING a lease, it's easy to overspend on things you

didn't want or didn't even ask for. Many people simply misunderstand the implications of the contract terms. Unfortunately, these mistakes can cost as much as the combined salaries of your company's top executives.

You can save yourself a bundle by knowing some of the more costly tricks or "gotchas" lurking within the language of standard lease agreements.

Gotcha No. 1: Interim rent

Many salespeople who deal with leasing candidly admit they make their entire commission from a seldom-recognized technique called interim rent. This is rent paid over and above the financing term of the lease, which is otherwise known as the initial period. The cost of the system is financed over the initial period. With interim rent, the lessor collects one extra payment (called a prorated payment) if the installation date does not fall on the first day of a month, or the commencement date. (Interestingly, first-day-of-the-month installations are a rare occurrence — perhaps

due to chance, perhaps due to design.)

For example, if the installation date falls on the second day of the month, the prorated payment covers 29 days. Consequently, the lessee pays 36 full payments (assuming it is a three-year lease) and one prorated payment that is only slightly less than a full payment. The financing, however, has been analyzed on the basis of 36 payments. Because the prorated payment is not part of the lease financing, it flows through as extra income and a percentage goes to the salesperson.

A more subtle ploy comes into play here. A lessor may offer a week's free use, say, starting on Nov. 27. That pushes the installation date into December, which causes the lessee to pay interim rent for three-plus weeks because the initial period now does not begin until the new commencement date of Jan. 1.

Advice: Make sure you only pay for the exact term you negotiated for.

Gotcha No. 2: 'Hell or high water' clause

Do not allow an initial period or term to begin with its inherent "hell or high water" (read: pay-up no matter what happens) provision before the lessor pays

the manufacturer for the equipment.

Otherwise, you could find yourself 10 weeks into a lease at \$110,000 per month only to be told by the lessor that it cannot raise the financing to fund the deal and pay the manufacturer for the equipment. In this case, the lessor may expect you to continue to make the monthly payments,

Contract terms to know:

Interim rent: Additional rent paid over and above the financing term of the lease.

Initial period: The term agreed to by the lessee.

Commencement date: First day of a month following the installation or acceptance of the equipment.

as per the "hell or high water" provision in the contract. After a few days, your lessor may even inform you that it can raise the long-term debt to fund the deal but only if your company agrees to new payments of \$122,000 per month.

Advice: Avoid beginning an uninterrupted payment stream to the lessor until it has given evidence of full supplier payment and evidence that the equipment has been satisfactorily tested.

Gotcha No. 3: Renewals

Another problem with standard lessor wording lies in the Term of Lease section

wherein the lease term is automatically extended for one year unless the lessee provides written notice at least six months prior to the end of the initial period.

Since the required written notice is due well before the time most users expect, this automatic renewal extends the lease before a lessee knows it — at the same rental amount.

The problem in administering this type of renewal provision is that the lease has been filed away for years, and the players have changed. The user may not want the same equipment for another year and now has to exercise an expensive buyout. Or if they do want it, a much lower rental amount should have been negotiated.

Advice: I recommend drafting provisions that give the lessee the right, but not the obligation, to renew. The right to renew should be for an amount equal to the lesser of 1) a predetermined amount; 2) a fair market rental based on actual equipment costs and rates then in effect; 3) competitive bids; 4) or an amount negotiated between the lessor and the lessee at the time of the renewal.

Auer is president of International Computer Negotiations, Inc., a consulting firm based in Winter Park, Fla.

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Concept Systems

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Computerworld's Friday Stock Ticker

Gainers Losers

Percent

PINTONIX INC.	42.1	IMRS (H)	-28.6
CREATIVE TECHNOLOGIES INC.	32.9	MAXTOR CORP.	-21.8
INACOM CORP.	30.4	IPL SYSTEMS INC.	-16.7
ANALYSTS INT'L	27.7	SEQUOIA SYSTEMS INC.	-15.9
XILINX	24.7	WESTERN DIGITAL CORP. (H)	-15.1
STRATACOM INC.	24.5	SEAGATE TECHNOLOGY	-14.7
WELLFLEET COMMUNICATIONS (H)	22.8	NETWORK SYSTEMS CORP.	-14.7
PICTURETEL CORP.	22.3	TRINZIC CORP.	-14.6

Dollar

MOTOROLA INC. (H)	14.75	IMRS (H)	-7.00
INTEL CORP. (H)	14.50	BGS SYSTEMS INC.	-3.00
PARAMETRIC TECHNOLOGY	10.00	MAXTOR CORP.	-3.00
CISCO SYSTEMS INC. (H)	8.88	WALKER INTERACTIVE SYSTEMS	-3.00
WELLFLEET COMMUNICATIONS (H)	8.25	SEAGATE TECHNOLOGY	-3.00
SYBASE INC. (H)	8.13	PROGRESS SOFTWARE CORP.	-2.25
SYNOPTICS COMMUNICATIONS (H)	8.13	SYSTEM SOFTWARE ASSOC.	-2.25
BMC SOFTWARE INC. (H)	8.00	IPL SYSTEMS INC.	-2.00

Industry Almanac

Net prospects good in '93

With a little cooperation from the economy, the big picture will be bright for networking and communications stocks this year.

According to Wall Street analysts, the fundamental technology directions driving 1992 gains for **Synoptics Communications, Inc.** (SNPX), **Cisco Systems, Inc.** (CSCO) and other companies will continue. John Rohal, senior communications analyst at Alex. Brown & Sons, Inc., pointed to the ongoing trends of downsizing, client/server implementations and the increasing reliability of local-area networks and internetworks.

"The reliability is improving, we have a better infrastructure of hubs and routers, and the idea of doing work through a LAN-based application is becoming very acceptable," Rohal said.

Companies are increasingly betting on enterprise-wide networks for greater business flexibility, which is leading to competitive advantage, Rohal said. "So on the fundamentals side, there's room for another great year."

During the calendar 1992 year, Synoptics led all technology issues with a 60½-point gain. Cisco rose 45½. (See CW, Jan. 11, 1993, page 108 for a list of the Top 20 dollar gainers and losers.)

However, in order to match their explosive growth of 1992, networking stocks will need some additional help from general economic conditions, Rohal said.

"If overall economic rates are fairly slow and interest rates stay moderate, these stocks are going to continue to look very attractive because they're growing quickly in a world where everything else is going slow," he said.

Analysts said investors will be willing to pay premium dollar for networking and communications stocks in such a business environment.

Rohal said specific issues that should perform well during the next year include market leaders **Novell, Inc.** (NOVL), **Banyan Systems, Inc.** (BNYN) and **Wellfleet Communications, Inc.** (WFLT), as well as Cisco. Novell, Wellfleet and Cisco also earned Buy ratings from Needham & Co. analyst Marly Cardozo in a 1992 year-end report.

Some companies that performed less spectacularly last year may catch on in 1993 as well.

Network General Corp. (NETG) is one possible rising star. Network General's Sniffer diagnostic products may gain more attention as LANs and internetworks become more complex and more mission-critical, according to both Needham and Alex. Brown.

—Derek Slater

EXCH	52-WEEK RANGE				JAN. 15	Wk Net	Wk Pct	EXCH	52-WEEK RANGE				JAN. 15	Wk Net	Wk Pct	
	3PM	CHANGE	CHANGE		3PM	CHANGE	CHANGE		3PM	CHANGE	CHANGE		3PM	CHANGE	CHANGE	
COMMUNICATIONS AND NETWORK SERVICES																
Up 6.8%																
OTC	31.00	9.63	3 COM CORP. (H)		31.00	2.50	8.8	OTC	19.75	10.25	INTERSOV INC.		13.75	1.25	-8.3	
NYS	74.50	56.25	AMERICAN INFO TECHS CORP.		74.25	3.13	4.4	OTC	21.38	9.50	KNOWLEDGEWARE INC.		13.25	1.63	-10.9	
NYS	54.00	36.63	AT&T		54.00	3.25	6.4	OTC	52.75	28.75	LEGENT CORP.		52.50	4.00	8.2	
OTC	4.25	0.75	ARTEL COMMUNICATION CORP.		1.81	0.00	0.0	OTC	38.75	14.75	LOTUS DEVELOPMENT		20.13	1.13	5.9	
OTC	24.00	10.25	BANYAN SYSTEMS INC.		24.00	3.00	14.3	OTC	23.25	13.00	McAfee ASSOCIATES		15.25	0.00	0.0	
NYS	53.88	40.25	BELL ATLANTIC CORP.		53.25	3.50	7.0	OTC	7.38	1.88	MEGA SOFTWARE		6.75	0.75	12.5	
NYS	55.50	43.38	BELLSOUTH CORP.		54.50	2.38	4.6	OTC	22.25	5.25	MENTOR GRAPHICS		9.38	0.50	5.6	
NYS	6.75	3.63	BOLT, BERANEK & NEWMAN		5.75	-0.25	4.2	OTC	42.75	27.25	MICRO FOCUS		41.63	-0.63	-1.5	
OTC	17.25	10.00	BROOKTROUT TECHNOLOGY		15.75	1.00	6.8	OTC	95.00	65.50	MICROGRAFX INC.		12.25	1.25	11.4	
NYS	87.00	42.13	CABLETRON SYSTEMS (H)		87.00	5.00	6.1	OTC	30.75	12.00	MICROSOFT CORP.		90.25	3.63	4.2	
OTC	30.25	17.75	CHIPCOM CORP.		29.75	3.75	14.4	OTC	59.00	25.25	PARAMETRIC TECHNOLOGY		59.00	10.00	20.4	
OTC	88.38	33.00	CISCO SYSTEMS INC. (H)		88.38	8.88	11.2	OTC	11.00	3.50	PHOENIX TECHNOLOGIES		31.75	-0.25	-0.8	
OTC	31.25	5.50	COMPRESSION LABS INC.		11.50	0.00	0.0	OTC	23.25	11.25	PLATINUM TECHNOLOGY		22.25	3.00	15.6	
NYS	3.38	0.88	DATA SWITCH CORP.		2.50	0.31	14.3	OTC	61.50	29.00	PROGRESS SOFTWARE CORP.		56.50	-2.25	-3.8	
NYS	23.63	13.75	DIGITAL COMM. ASSOC.		19.75	0.88	4.6	OTC	26.50	3.50	QUARTERDECK OFFICE SYS.		3.50	-0.50	-12.5	
OTC	14.75	7.50	DIGITAL SYSTEMS INT'L INC.		10.75	-0.25	-2.3	OTC	32.75	11.75	RAINBOW TECHNOLOGIES INC.		17.75	0.25	1.4	
OTC	23.88	4.00	DSC COMMUNICATIONS (H)		23.25	0.38	1.6	OTC	22.75	4.00	RASTEROPS		6.63	-0.50	-7.0	
OTC	10.88	4.75	FIBRONIX INT'L INC.		8.75	1.25	16.7	OTC	17.25	3.63	ROSS SYSTEMS		9.13	0.63	7.4	
OTC	37.50	10.50	FILENET CORP.		16.25	1.75	12.1	OTC	27.25	8.50	SAPIENS USA INC. (H)		26.25	0.50	1.9	
OTC	4.06	1.50	GANDALF TECHNOLOGIES INC. (H)		4.06	0.69	20.4	OTC	26.25	6.75	SOFTWARE PUBLISHING CORP.		8.75	-0.25	-2.8	
OTC	2.25	0.69	GATEWAY COMMUNICATIONS		1.50	0.19	14.2	OTC	8.50	2.00	SOFTWARE TOOLWORKS INC.		8.50	1.00	13.3	
NYS	7.25	2.88	GENERAL DATACOMM IND. (H)		7.25	0.50	7.4	OTC	7.25	0.75	SPINNAKER SOFTWARE		1.13	-0.13	-10.0	
ASE	5.88	1.38	GO VIDEO		3.00	-0.13	-4.0	OTC	16.50	3.25	STATE OF THE ART		8.50	-0.50	-5.6	
NYS	35.75	28.88	GTE CORP.		35.50	1.13	3.3	OTC	25.25	13.75	STERLING SOFTWARE INC.		21.13	1.25	6.3	
NYS	72.13	56.25	ITT CORP.		71.13	1.13	1.6	OTC	29.00	8.00	STRUCT. DYNAMICS RESEARCH		12.38	0.13	1.0	
OTC	42.50	29.50	MCI COMMUNICATIONS CORP. (H)		42.50	2.00	4.9	OTC	53.75	21.00	SYBASE INC. (H)		53.75	8.13	17.8	
OTC	14.25	2.25	MICROCOM INC.		5.88	-0.13	-2.1	OTC	5.100	5.88	SYMANTEC CORP.		13.13	0.38	2.9	
OTC	20.50	12.00	NETRIX CORP.		19.00	0.25	1.3	OTC	13.75	5.25	SYSTEMS CENTER INC.		7.88	0.13	1.6	
OTC	16.75	9.63	NETWORK COMPUTING DEVICES		15.25	0.38	2.5	OTC	25.50	11.84	SYSTEM SOFTWARE ASSOC.		21.75	-2.25	-9.4	
NYS	18.25	8.13	NETWORK EQUIPMENT TECH. (L)		8.88	-0.75	-7.8	OTC	13.25	2.50	TRINZIC CORP.		4.38	-0.75	-14.6	
OTC	25.50	8.00	NETWORK GENERAL		19.00	1.00	5.6	OTC	23.75	14.50	WALKER INTERACTIVE SYSTEMS		17.75	-3.00	-14.5	
OTC	17.88	8.50	NETWORK SYSTEMS CORP.		10.88	-1.88	-14.									

Intel profits rise

Citing an across-the-board uptick in demand, **Intel Corp.** last week reported fourth-quarter net profits of \$429 million, up 127% from the comparable period last year. Revenue was \$1.86 billion, up 54% from the same quarter in 1991. For the year, the Santa Clara, Calif.-based chip maker achieved record profits and revenue of \$1.07 billion and \$5.84 billion, respectively, up 30% and 22% respectively from 1991.

Adobe results mixed

Adobe Systems, Inc. recorded fourth-quarter profits of \$8.4 million, off 46% from the like period last year. The net included a \$6 million write-off of a real estate partnership investment. Revenue for the quarter was \$70.7 million, up 13% from 1991. For the year, the Mountain View, Calif.-based company earned \$43 million on revenue of \$265 million — off 16% and up 16%, respectively, from last year.

SHL back in black

SHL Systemhouse, Inc. posted fiscal first-quarter net earnings of \$300,000, compared with a net loss of \$1.3 million in the year-earlier period. Revenue for the period ended Nov. 30, 1992, grew 10%, to \$201.6 million. Services revenue jumped 55% in the quarter, the Ottawa-based company said.

SHORT TAKES Citing weakness in the U.S. and Asian markets, **Intergraph Corp.** in Huntsville, Ala., said its fourth-quarter revenue would be below expectations — in the \$305 million to \$310 million range — pushing the workstation maker into a break-even position for the period. . . . Artificial intelligence pioneer **Sym-
bolics, Inc.** is reducing its 110-person work force by 36% after a 29% decline in second-quarter revenue.

Strong growth predicted for high-tech industry

By Gary H. Anthes
WASHINGTON, D.C.

As usual, high-technology industries lead the way in the annual forecast of industrial activity compiled by the U.S. Department of Commerce. The agency predicted the U.S. economy will grow 3% overall in real terms in 1993, but it said sales of most computer-related products and services are expected to increase from three to five times that rate (see chart).

But more sales will not necessarily translate into more jobs. The Commerce Department said the computer equipment industry will post its fifth consecutive annual loss of employment,

Rosy outlook			
Worldwide growth projections for selected U.S. industries (in billions)			
	1992	1993	Increase
Electronic information services	\$11.6	\$13.5	16.4%
Data processing and network services	\$40.2	\$45.7	13.7%
Computer professional services	\$55.5	\$61.0	9.9%
Computer hardware and peripherals	\$53.7	\$58.0	8.0%
Packaged software*	\$23.3	\$26.5	13.7%

*U.S. only

Source: U.S. Department of Commerce

CW Chart: Michael Siggins

with the work force shrinking from 224,000 to 220,000 people, down from a peak of 290,000 workers in 1988.

"Computer equipment should be one of the strongest sectors in 1993, with domestic purchases growing rapidly and exports resurging," said Timothy J. Hauser, acting undersecretary for international trade. "While some growth in mainframe sales is expected, the most significant trend is downsizing. In 1993, workstation sales are expected to grow by 28%, to \$14 billion."

Back on track

The bullish projections found in the Commerce Department's "U.S. Industrial Outlook 1993" report are partially based on surveys of U.S. business spending plans. Those surveys found that "a large number of corporate information systems directors were beginning to reinstate major computer hardware procurements, previously deferred or canceled, to relieve substantial pent-up demand for greater processing power."

"Eight percent growth [for hardware] is very reasonable, very doable," said Neeraj K. Vohra, computer industry analyst at Standard &

Poor's Corp. in New York. "And that means significantly higher growth — maybe 15% to 20% — in unit sales because prices are falling."

Vohra said the PC price wars, which are temporarily on hold due to a shortage of Intel Corp. 486 microprocessors, will resume by midyear, fueling higher sales. That, combined with the robust sales of PCs in 1992, will sharply boost sales of peripherals as well, he said.

On the money

Last year, the Commerce Department overpredicted the performance of the computer industry but only slightly. Current estimates for 1992 sales lie in the range of 95% to 100% of the forecasts the agency made in 1991.

The Commerce Department report also predicted the following:

- Semiconductor firms will boost shipments by 12% in 1993, as they did in 1992.
- The downsizing trend will hold mainframe sales growth to 4%, about twice the rate of growth in 1992. Price per million instructions per second (MIPS) will fall from \$100,000 in 1992 to \$15,000 in 1995.
- Sales of conventional supercomputers will grow 5%, but sales of massively parallel computers will rise 40% to \$420 million.
- Shipments of midrange systems will grow by roughly 8%.
- Sales of workstations will soar 28% while uniprocessor performance for high-end units will climb to 300 MIPS.
- The U.S. PC market will grow 6%.
- Laptop sales will grow 8%, while notebook shipments will nearly double in volume.
- The value of U.S. computer imports including parts and peripherals will exceed the value of exports for the third year in a row, boosting the U.S. computer trade deficit to \$7 billion.

"Much of the import growth is in peripheral equipment and parts from U.S. offshore and foreign plants," Hauser said. "The growth in imports reflects the fact that the production of hardware is becoming more globalized. At the same time, the U.S. computer industry continues to be extremely competitive in systems and software technologies."

Prodigy to cut staff 22%

By Ellis Booker

WHITE PLAINS, N.Y.

Prodigy Services Co., the on-line services joint venture between IBM and Sears, Roebuck and Co., last week said it would slash 250 positions, or more than 22% of its 1,100-person work force.

In addition, Prodigy will use a Sears unit, SPS Payment Services, Inc., to handle its customer service operation. Sixty-five Prodigy employees are being offered jobs at SPS, and Prodigy said it will pay for their relocation.

Formed in 1984, Prodigy began its graphical, on-line service in October 1988. The information service claims that it has 2 million households as subscribers and 85 companies that advertise on-line.



Small increase

While the Commerce Department says U.S. computer industry revenue will rise by billions of dollars this year, it is not clear where the money is going to come from. Computer Sciences Corp. recently

completed a survey of 407 IS executives and found that IS budgets will rise just 2.3% in the U.S. and .4% in Europe this year, the smallest increases in five years.

"You have to assume [Prodigy President Ross Glatzer] was getting pressure from IBM," said Lorraine Sileo, editor of "IDP Report," a weekly newsletter on the information services industry published by Simba Information, Inc. in Wilton, Conn. Prodigy's announced layoffs last week followed several senior executive departures.

Prodigy rejected speculation that IBM or Sears had a hand in pressuring the decision. "There was none," said a spokesman, adding that senior executives from both companies have been quoted as saying they have no intention of changing their relationship with each other or Prodigy.

While Prodigy officials will make no calendar predictions about profitability, Sileo predicted the service could go into the black by next year. "They have a good chance after this restructuring and the write-offs," she said.

Prodigy's Media operation will now be split into four lines of business, each with its own general manager.

Wysiwyg



WINDOWS WEIRDNESS

By Jeff McGroary

But do they do toga parties?

Residents of the Computer Science House at Rochester Institute of Technology have been working on a system that lets a student use a workstation to buy a can of Coke from a vending machine down the hall — with can delivery timed to how long it takes the student to walk to the machine.



Want to get to one of Windows 3.1's undocumented features? Try this combination:

1. Press and hold the Ctrl and shift keys throughout the remaining steps.
2. From the Program Manager "Help" menu, open the "About" dialog box.
3. Double-click on one of the panes of the Windows logo in the upper left-hand corner of the dialog box.
4. Click the "OK" button.
5. Repeat steps 2 and 3 again, double-clicking on the same pane. Notice the fluttering Windows logo flag.
6. Click the "OK" button.
7. Repeat steps 2 and 3 again. Depending on which pane you clicked, you'll see either Bill Gates, Steve Ballmer, Brad Silverberg or T-Bear (the Windows 3.1 development team mascot) pointing to the scrolling credits listing members of the development team.

Find any interesting, undocumented features in your applications? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

The Fifth Wave



"AND TO COMPLETE OUR MULTIMEDIA PRESENTATION..."

Inside Lines

Let's hope the E-mail is shorter than the speeches

Jeff Eller, a communications aide for President-elect Bill Clinton, told *Computerworld* last week that the new administration will make its speeches and other public documents available on-line and eventually plans to allow the public to communicate with the White House via electronic mail. "We have a real commitment to make this happen, but it won't happen overnight," Eller said in a telephone interview from Little Rock, Ark. He added that the CompuServe/Internet address used by the Clinton campaign for public communications will remain open when Clinton takes over the White House. That address is 75300.3115.

Hold that eraser, really

The Bush White House, after being ordered to save some 4,000 mainframe backup tapes for posterity [CW, Jan. 11], wanted to erase the original messages and PC hard disks to "wipe the slate clean" for the incoming Clinton administration. After a federal judge issued another order blocking the erasure of any electronic federal records, the Bush administration made a last-ditch appeal to the U.S. Court of Appeals. The appeals court said late Friday that the White House could erase records, but only if complete backup tapes are made.

Core of the problem

Apple Computer recently unveiled a new keyboard that splits in the middle and allows users to adjust the angle at which they type, thus reducing stress-related injuries. However, in 1986 Anthony Hodges patented a remarkably similar product; he has been trying unsuccessfully to get Apple to produce it ever since. Apple officials deny they stole the idea.

Not yet ripe

Still waiting for a new PowerBook 180, Performa 600 or Quadra 950? Better sit tight. Apple Computer Chairman John Sculley last week bumped back the full-availability date of products already in short supply. "We do not expect to be out of backlog on certain products until the second half of the year," Sculley said. No word on what those "certain products" are.

To route or to bridge?

High-end-router maker Coral Network Corp. next week will introduce a version of its Backbone Express internetworking gear that is said to beef up routing performance to rival that of bridging, "making the choice to bridge or route a nonissue," according to a company official. Users today often elect to bridge traffic between networks for the benefit of higher speeds, though they give up routing benefits of partitioning networks for security and automatic reroute around failures.

When lawyers meet hackers

The most vigilant system administrators and security officers use network analyzers to monitor the keystroke activity of outside hackers. But a super-picky reading of federal wiretap law reveals that they may be breaking the law because they are "intercepting" the messages. So, the legal eagles at the U.S. Department of Justice have come up with a humongous, 101-word warning message that federal agencies should use on their log-on screens to notify regular users and hackers that their keystrokes may be monitored.

The FCC has more than one Howard Stern to contend with. Sprint Data Group's director of market analysis happens to carry the same moniker as the generously mated, uninhibited radio deejay and sometime TV personality who has riled the FCC over what it considers to be "pornographic" material. The well-groomed Howard J. Stern from Sprint, who frequently visits the FCC on telecommunications issues, said he gets more than a sideways glance when he signs in under his real name. He has been advised to scribble down an alias to avoid potential unrest and abuse at FCC headquarters. Got any news tips? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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